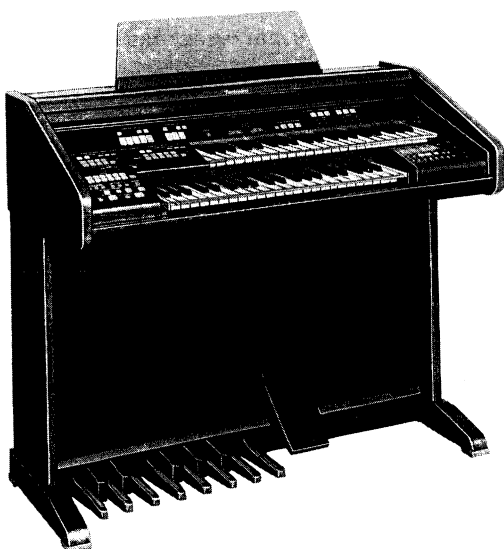


Service Manual

Electronic Organ SX-EN3



(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW),
(EA), (EP), (EK), (XL), (XR), (XS), (XD), (X)

AREAS

(M):	U.S.A.	(EK):	the United Kingdom
(MC):	Canada	(XL):	New Zealand
(XM):	Mexico	(XR):	Australia
(EN):	Norway, Sweden, Denmark, Finland	(XS):	Malaysia, Singapore, South Africa
(EH):	Holland	(XD):	Saudi Arabia, Kuwait
(EF):	France, Italy, Belgium	(X):	the Middle East, Indonesia, Hong Kong, the Philippines, Thailand, Taiwan
(EZ):	Germany		
(EW):	Switzerland		
(EA):	Austria		
(EP):	Spain, Portugal, Greece		

■ Specifications

KEYBOARD		UPPER KEYBOARD 44 KEYS LOWER KEYBOARD 44 KEYS PEDAL KEYBOARD 13 KEYS	
SOUND GENERATOR		PCM	
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY		32 NOTES (NUMBER OF NOTES WHICH CAN BE INPUT SIMUL- TANEOUSLY: UPPER KEYBOARD 8 NOTES, LOWER KEYBOARD 8 NOTES, PEDAL KEYBOARD 1 NOTE)	
SOUNDS	ORCHESTRAL CON- DUCTOR		○
	PARTS		UPPER KEYBOARD: TAB & ORGAN, POLY, SPECIAL LOWER KEYBOARD: TAB & ORGAN, POLY, SPECIAL
	UPPER	POLY, SPECIAL	20 SOUNDS (10 SOUNDS×2 VARIATIONS) PIANO, ELECTRIC PIANO, HARPSICHORD/VIBES, GUITAR, ELECTRIC GUITAR, BRASS, SAX/SYNTH BRASS, REED, FLUTE, STRINGS
		TAB	FLUTE 16', 8', 4', 2' PERC 2-2/3'
		ORGAN	1-5
	LOWER	POLY, SPECIAL	16 SOUNDS (8 SOUNDS×2 VARIATIONS) PIANO, ELECTRIC PIANO, HARPSICHORD, GUITAR, BRASS, SAX/SYNTH BRASS, REED, STRINGS
		TAB	FLUTE 8', 4', 2'
		ORGAN	1-3
	BASS		8 SOUNDS (4 SOUNDS×2 VARIATIONS) ORGAN, ACOUSTIC, ELECTRIC, SPECIAL
	ONE TOUCH REGISTRATION		○

EFFECTS	SUSTAIN	UPPER, LOWER, BASS
	EFFECT	UPPER, LOWER, BASS
	TOUCH	UPPER, LOWER
	DIGITAL REVERB	○ (ROOM, STAGE, HALL)
	GLIDE	UPPER
	TREMOLO	UPPER TAB & ORGAN, LOWER TAB & ORGAN (SLOW/FAST)
RHYTHM	CELESTE	UPPER TAB & ORGAN, LOWER TAB & ORGAN
	RHYTHM	36 RHYTHMS (12 RHYTHMS×3 VARIATIONS) MARCH, COUNTRY, WALTZ, SWING 1, 2, LATIN 1, 2, 8 BEAT, ROCK, 16 BEAT 1, 2, DISCO
	CONTROL	START/STOP, SYNCHRO & BREAK, INTRO & ENDING, FILL IN 1, 2, COUNT INTRO, TEMPO
	KEYBOARD PERCUS- SION	34 KEYS
AUTO PLAY CHORD		AUTO PLAY CHORD (FINGERED 1, 2, MEMO), ONE TOUCH PLAY, MUSIC STYLE ARRANGER
TECHNI-CHORD		○
VOICE SETTING COM- PUTER		1-3
DISPLAY		○ (LCD)
DEMO		○
COMPOSER		5 TRACKS (PART: BASS, ACCOMP 1, 2, 3, DRUMS) STORAGE CAPACITY: APPROX. 1800 NOTE RECORDING MODE: REALTIME EDIT FUNCTIONS: COMPOSER CLEAR, BAR BEAT, QUANTIZE, PERCUSSION ERASE

Technics

SEQUENCER	8 TRACKS (PART: UPPER, LOWER, BASS, CHORD, UPPER POLY, LOWER POLY, DRUMS, CONTROL) STORAGE CAPACITY: APPROX. 6000 NOTES RECORDING MODE: REAL TIME, STEP (CHORD, RHYTHM) EDIT FUNCTIONS: SONG CLEAR, TRACK CLEAR, TRACK ASSIGN	OUTPUT	50W
MIDI	CHANNEL, OCTAVE SHIFT, LOCAL CONTROL, VSC PROGRAM CHANGE, START/STOP, MIDI CLOCK, SONG SELECT, PROGRAM CHANGE MODE, NOTE ONLY, MIDI LOAD, MIDI OUT	SPEAKERS	20cm×1, 6.5cm×1, (13cm×6cm)×1
CONTROL	VOLUME, TEMPO/PROGRAM, TRANSPOSE	POWER REQUIREMENT	155W 105W (NORTH AMERICA AND MEXICO) AC120/220/240V 50/60 Hz AC120V 60 Hz (NORTH AMERICA AND MEXICO) AC230V 50/60 Hz (EUROPE EXCEPT FOR UNITED KINGDOM)
EXTERNAL MEMORY	DIGITAL DISK RECORDER (OPTIONAL)	DIMENSIONS (W×H×D)	111cm×112.4cm×54.4cm (43-11/16"×44-1/4"×21-13/32") 111cm×112.4cm×58.9cm (43-11/16"×44-1/4"×23-3/16") (USA AND MEXICO)
TERMINALS	PHONES×2, LINE OUT AUX IN, MIDI (IN, OUT, THRU)	NET WEIGHT	54 kg (119.1 lbs.) 55 kg (121.3 lbs.) (USA AND MEXICO)
OTHERS	POWER SWITCH, MAIN VOLUME, EXPRESSION PEDAL, FOOT SWITCH		

- Specifications are subject to change without notice for further improvement.

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9 DEMO

An automatic performance introduces you to the organ's sounds and rhythms.

10 VOICE SETTING COMPUTER

Set up the sounds, effects and volumes for each part, and then store the settings in one of the three memory buttons for instant recall as you play. You can expand the range of storable settings to include the rhythm selection, tempo settings and more.

11 RHYTHM

Choose from 12 preset automatic rhythms, each with three variations. An additional 8 memory locations are reserved for user-created rhythms. Other rhythm controls are **START/STOP**, **SYNCHRO & BREAK**, **INTRO & ENDING**, **COUNT INTRO**, and **FILL IN 1** and **2**. The volume is adjusted with the **DRUMS** buttons in the **VOLUME** section.

12 AUTO PLAY CHORD

This feature is activated when the **FINGERED 1** or **FINGERED 2** button is turned on. An automatic accompaniment appropriate for the selected rhythm is produced when you play a chord on the lower keyboard. **MEMORY** allows you to continue the accompaniment even after the chord keys are released. The volume for each part of the **AUTO PLAY CHORD** (**DRUMS**, **BASS**, **ACCOMP**) is adjusted with the respective buttons in the **VOLUME** section.

13 DIGITAL REVERB

Press one of the three **DIGITAL REVERB** buttons—**ROOM**, **STAGE** or **HALL**—to add the corresponding reverberation effect to the sound.

14 KEYBOARD PERCUSSION

One press of the **KEYBOARD PERCUSSION** button transforms your lower keyboard into a whole band of percussion instruments and special sounds. The keys are picture-coded for quick and easy selection.

15 ONE TOUCH PLAY

Select a rhythm and press the **ONE TOUCH PLAY** button until the panel settings change. The sounds and effects perfect for the selected rhythm are automatically set in seconds. Or use it as a **ONE TOUCH REGISTRATION** button to automatically match the lower and pedal keyboard settings to the selected upper keyboard sound.

16 MUSIC STYLE ARRANGER

A tap of a button during your performance changes the rhythm and sounds to a simpler or more complex arrangement to match the feeling of the music.

17 TECHNI-CHORD

Chord notes played on the lower keyboard are added to the melody notes played on the upper keyboard. Choose from four harmony styles.

18 STEP REC

Store the chord progression for an entire song for automatic playback when you use the **AUTO PLAY CHORD**.

19 SEQUENCER

With this feature you can separately play and record the parts for an entire song. Then have the whole ensemble performance played back automatically.

20 COMPOSER

Create original rhythm patterns or modify preset rhythms. Store up to 8 new rhythms in the reserved memory locations and recall them as you play, just like the preset rhythms.

21 Program section

This matrix is used to select various functions in conjunction with making the sound settings, initializing the memories, recording a performance, creating an accompaniment pattern, using the Digital Disk Recorder and making the MIDI settings.

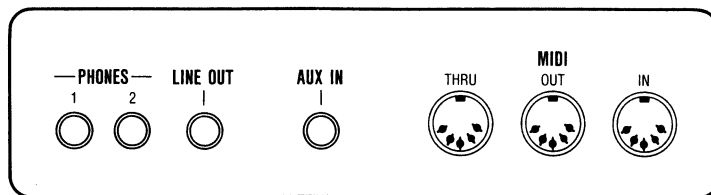
22 Expression pedal/foot switch

Control the volume of all the organ sounds as you play to add expression to the music. The foot switch on the side of the pedal is used as a glide control to lower the pitch of the organ by one half-tone, but you can assign one of various other functions to the foot switch.

23 Digital Disk Recorder (optional)

The Digital Disk Recorder allows you to store up to 20 sequencer performances on a 3.5-in. 2DD memory disk.

TERMINALS



(Beneath the right side of the keyboard)

PHONES (Use headphones with over 16 Ω impedance.)
For silent practice, headphones (option) may be used. When plugged in, the speaker system is automatically switched off, and the sound is heard only through the headphones.

AUX IN (input level 0.5 Vrms, 33 k Ω)
Other instruments such as a sound generator can be connected to this terminal, and the sound will be output from the Organ's speakers.

LINE OUT (output level 1.5 Vrms, 600 Ω)
By connecting an external high-power amplifier, the sound can be reproduced at a high volume.

MIDI

MIDI is standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics organ and equipment provided with MIDI terminals.

IN: The terminal that receives data from external equipment.

OUT: The terminal that transmits data from the organ to external equipment.

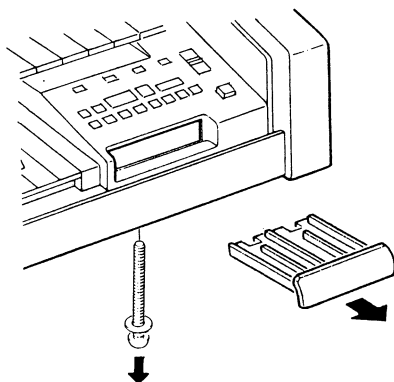
THRU: The terminal that transfers data from the **IN** terminal directly to other equipment.

- Use a 5-pin DIN cord (less than 15m long) for these connections.

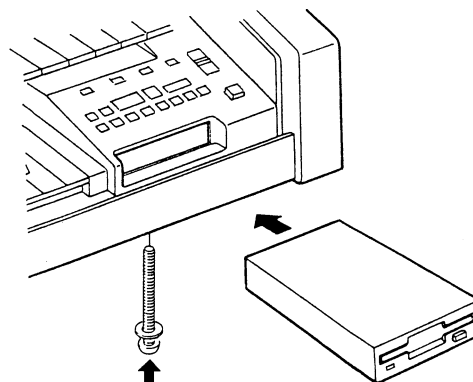
DIGITAL DISK RECORDER SY-FD20 (OPTION)

Make sure that the power to the organ is turned off.

1. Remove the cover from the connector unit (right end of the lower keyboard) by first removing the screw (beneath the keyboard) with a cross-point screwdriver.

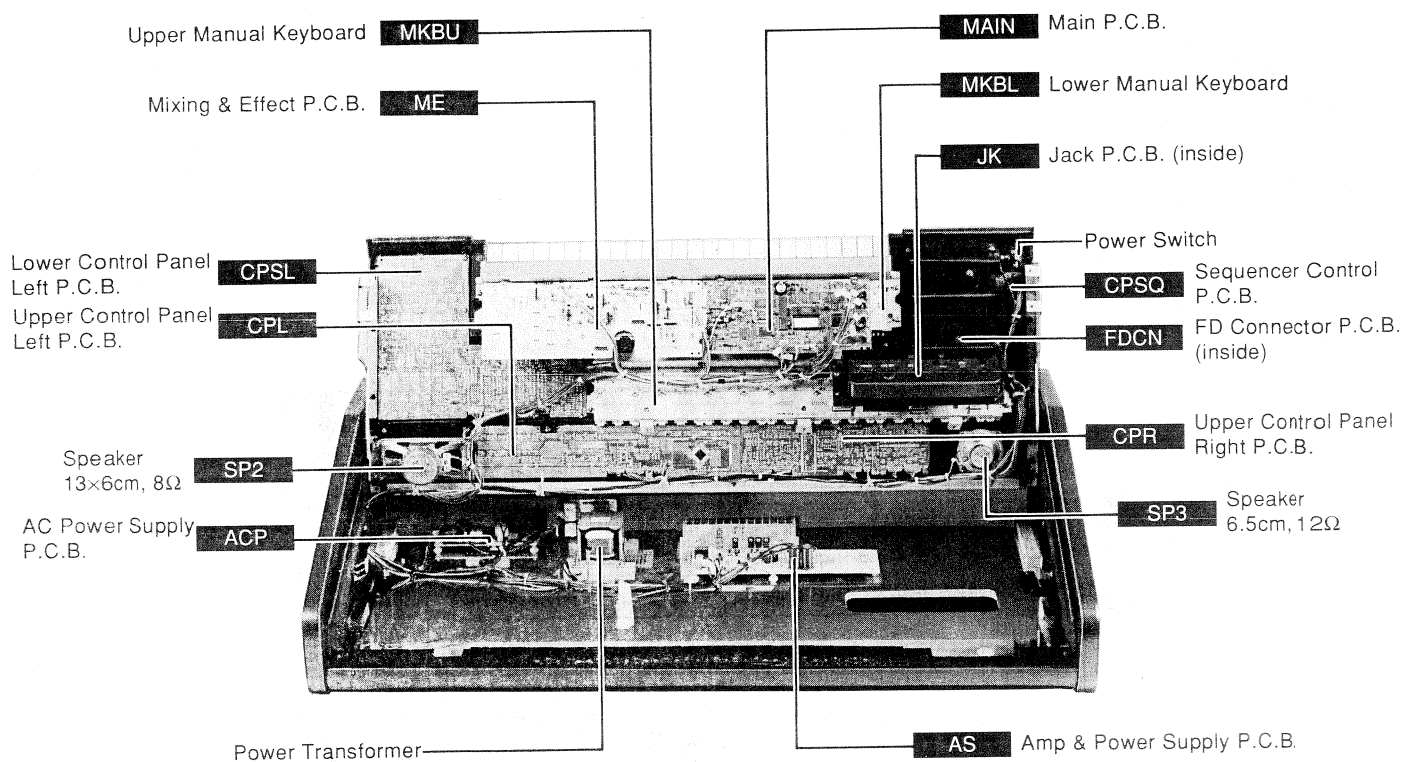


2. Insert the Digital Disk Recorder and push it in firmly and completely. Secure it with the screw you removed in step 1.

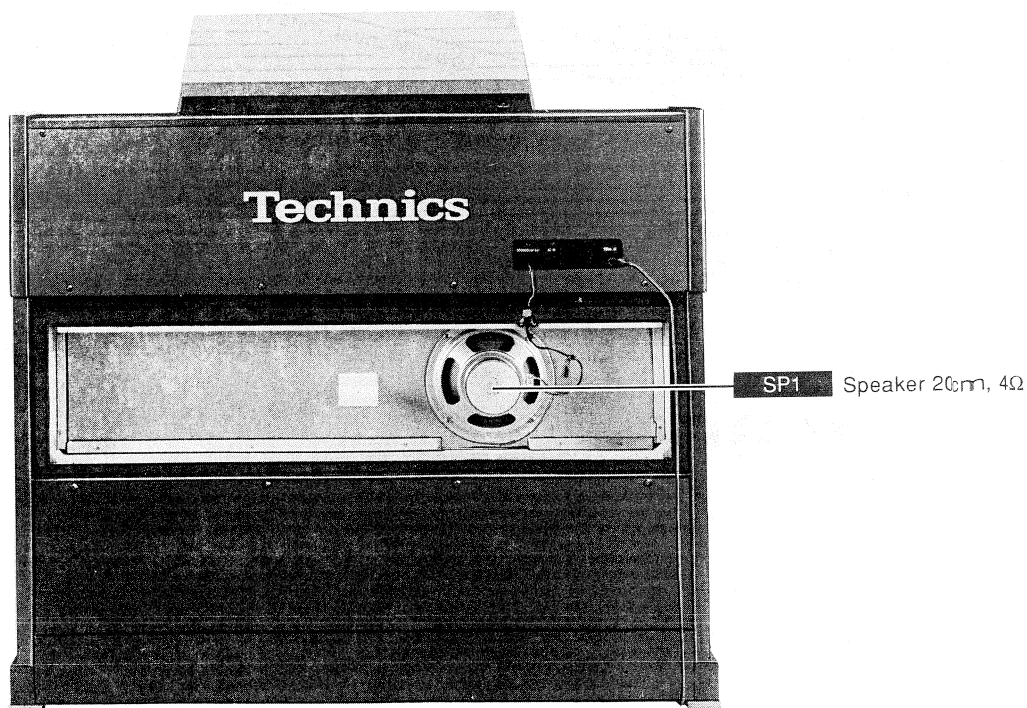


- Note: Be sure to affix the Digital Disk Recorder with the same screw which was used to affix the cover, in order to avoid damage to the Digital Disk Recorder.

PARTS LOCATION



[Photo-1]

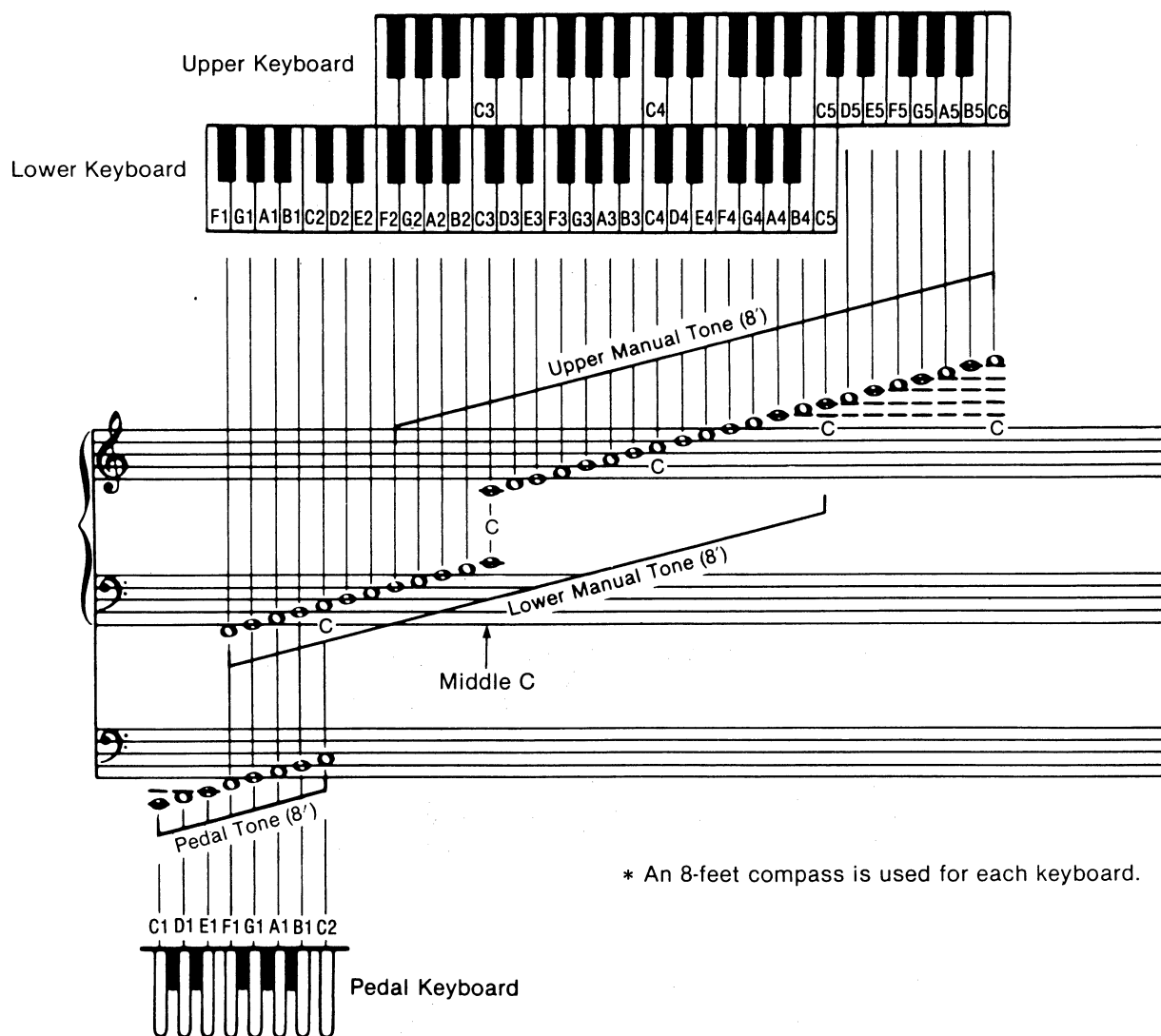


[Photo-2]

KEYBOARD RANGES

- This manual keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.

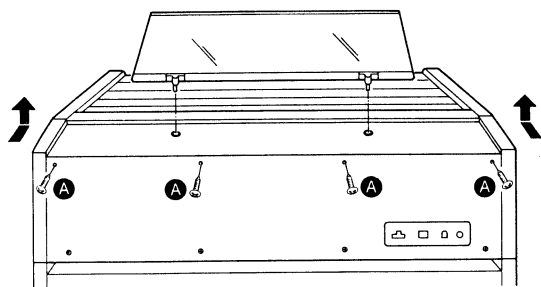
Upper Keyboard 44 Keys
 Lower Keyboard 44 Keys
 Pedal keyboard 13 Keys



DISASSEMBLY INSTRUCTIONS

1 Removing the top cover

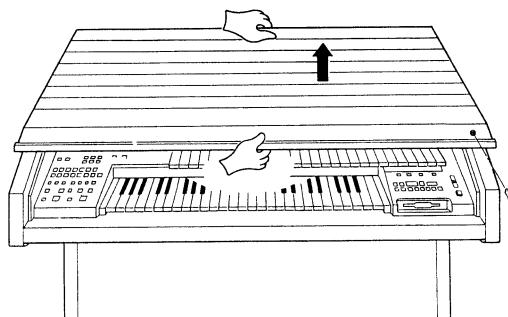
1. Remove the music stand.
2. Remove the top cover holding screws located on the rear board (A 4 pcs.).
3. Remove the top cover, sliding it forward and lift.



[Fig. 6]

2 Removing the sliding cover

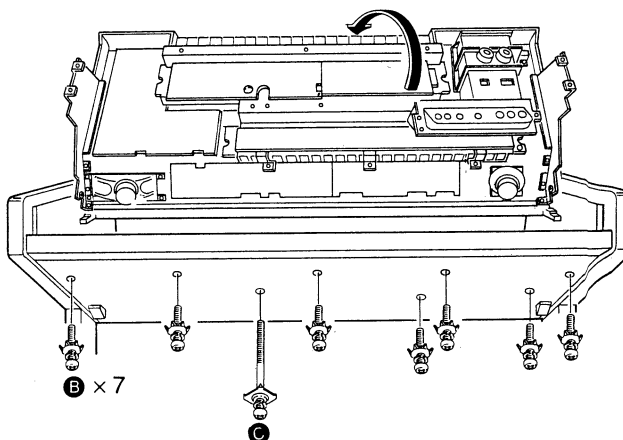
1. Remove the top cover (see step 1.).
2. Unlock the sliding cover with the accessory key.
3. Remove the sliding cover in its fully closed position.



[Fig. 7]

3 Opening the control panel with keyboard unit

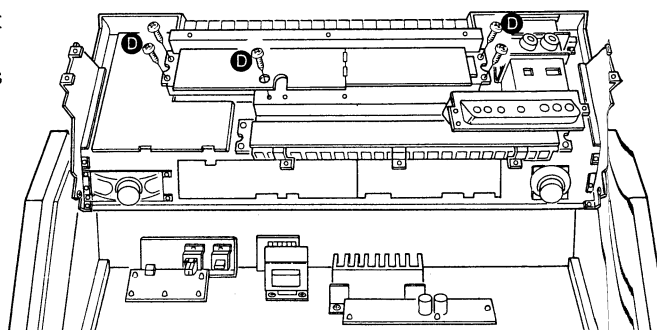
1. Remove both top cover and sliding cover (see steps 1 and 2.).
2. Remove the control panel holding screws located under the upper cabinet (B 7 pcs. and C 1 pc.).
3. The control panel with keyboard unit can now be opened upwards.



[Fig. 8]

4 Removing the lower keyboard

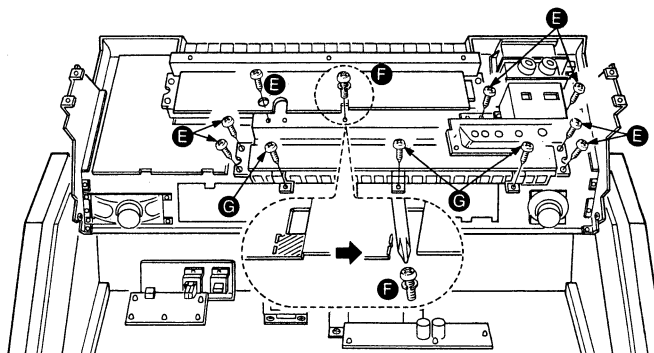
1. Open the control panel with keyboard unit (see step 3.).
2. Remove the connectors on the printed circuit boards.
3. Remove the lower keyboard ass'y holding screws (D 5 pcs.).
4. The lower keyboard ass'y can be removed.



[Fig. 9]

5 Removing the upper keyboard

1. Open the control panel with keyboard unit (see step 3.).
2. Remove the connectors on the printed circuit boards.
3. Remove the upper keyboard ass'y holding screws (E 7 pcs. and G 3 pcs.).
4. Bend the printed circuit board along the scored line and remove the screw (F 1 pc.).
5. The upper keyboard ass'y can be removed.



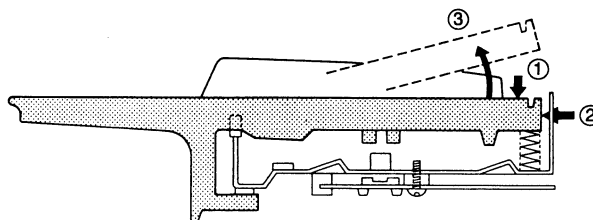
[Fig. 10]

6 Removing the keys

1. Remove the keyboard by following the procedure in step 2.
2. Press downward on the rear of the key (Fig. 11-①).
3. While pressing downward on the rear of the key, push the key forward and release it from the chassis (Fig. 11-②).
4. Lift the key and remove it from the chassis (Fig. 11-③).

NOTE:

To remove a black key, the white key to either side of it should be removed first.



[Fig. 11]

7 Removing the ME and MAIN P.C.B.

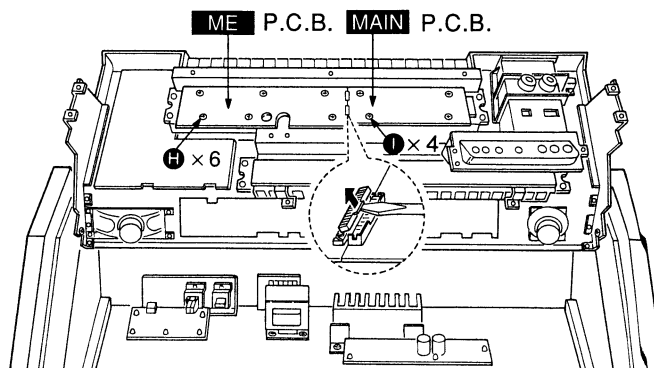
- Open the control panel with keyboard unit (see step 3).

ME P.C.B.

1. Remove the connector which joins the 2 P.C.B.s with a screwdriver as shown in the figure.
2. Remove the ME P.C.B. mounting screws (H 6 pcs.).

MAIN P.C.B.

1. Remove the connector which joins the 2 P.C.B.s with a screwdriver as shown in the figure.
2. Remove the MAIN P.C.B. mounting screws (I 4 pcs.).



[Fig. 12]

8 Removing the **ACP** and **AS** P.C.B.

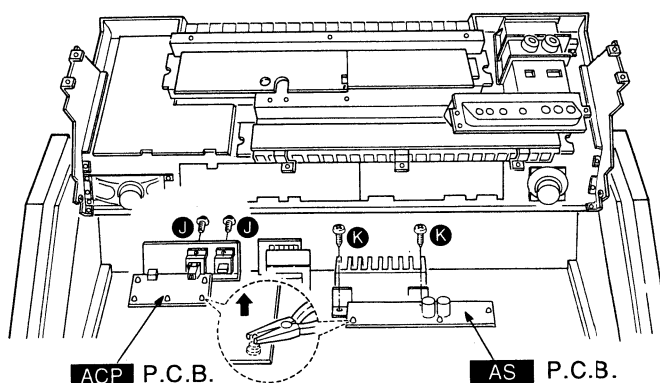
- Open the control panel with keyboard unit (see step 3).

ACP P.C.B.

1. Remove the jack mounting screws on the jack panel (● 2 pcs.).
2. Release the 5 claws of the P.C.B. holder to remove the **ACP** P.C.B.

AS P.C.B.

1. Remove the **AS** P.C.B. mounting screws (K 2 pcs.).
2. Release the 3 claws of the P.C.B. holder to remove the **AS** P.C.B.



[Fig. 13]

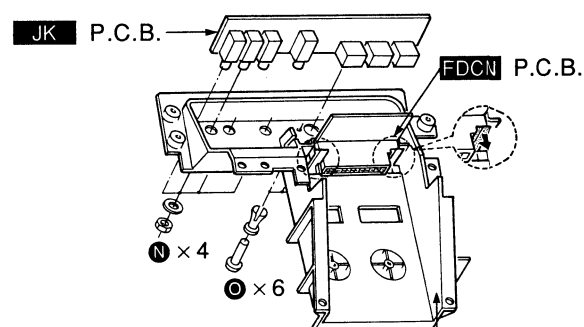
9 Removing the **JK** and **FDCN** P.C.B.

JK P.C.B.

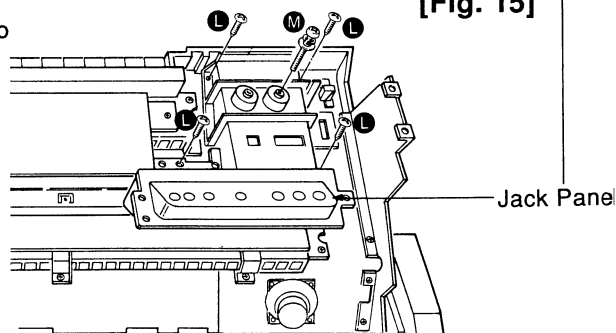
1. Open the control panel with keyboard unit (see step 3).
2. Remove the jack panel mounting screws (L 4 pcs. and M 1 pc.). The jack panel can then be removed.
3. Remove the **JK** P.C.B. mounting nuts and latches (N 4 pcs. and O 6 pcs.).

FDCN P.C.B.

1. Remove the jack panel by following the steps above.
2. Release the 2 claws holding the **FDCN** P.C.B. to remove it.



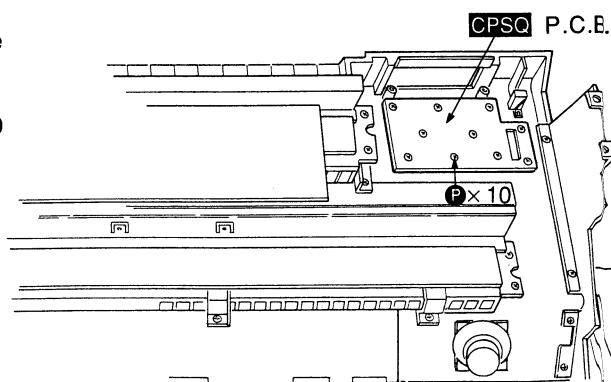
[Fig. 15]



[Fig. 14]

10 Remove the **CPSQ** P.C.B.

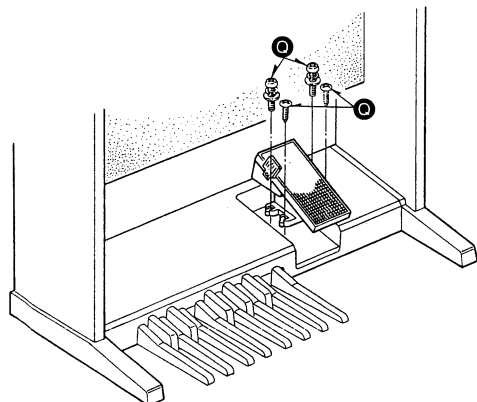
1. Open the control panel with keyboard unit (see step 3).
2. Remove the jack panel (see step 9).
3. Remove the **CPSQ** P.C.B. mounting screws (P 10 pcs.).



[Fig. 16]

11 Removing the expression pedal

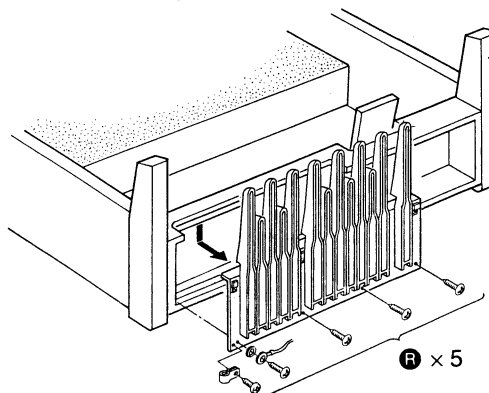
1. Remove the expression pedal mounting screws (● 4 pcs.). The expression pedal can then be removed.



[Fig. 17]

12 Removing the pedal keyboard

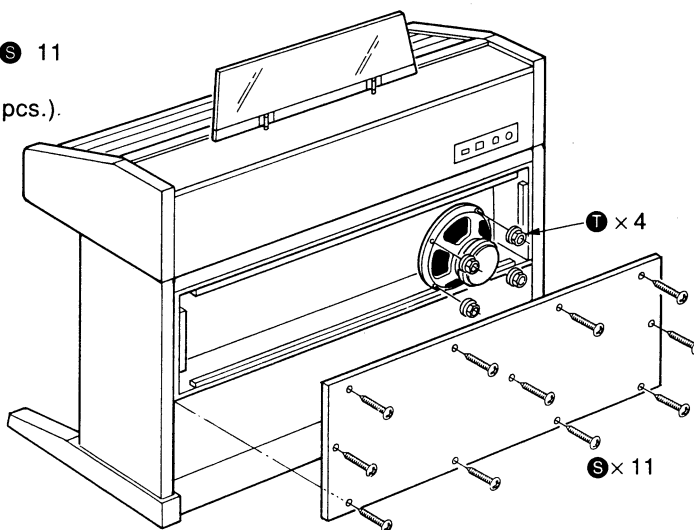
1. Remove the pedal keyboard mounting screws (● 5 pcs.).
2. Remove the pedal keyboard by pulling in the direction indicated by the arrow.



[Fig. 18]

13 Removing the speaker

1. Remove the rear board mounting screws (● 11 pcs.).
2. Remove the speaker mounting nuts (● 4 pcs.) and then remove the speaker.

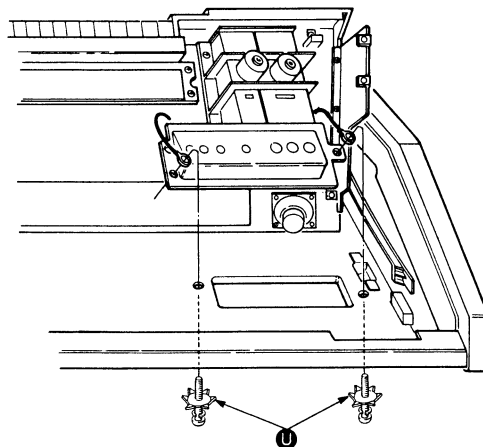


[Fig. 19]

■ Important:

when closing the control panel

- When closing the control panel, make sure that the JK P.C.B. ground wire is in the position shown in Fig. 20 and affix it securely with screws (● 2 pcs.).
- After tightening the screw, please confirm once more that the ground wire is in the proper position.



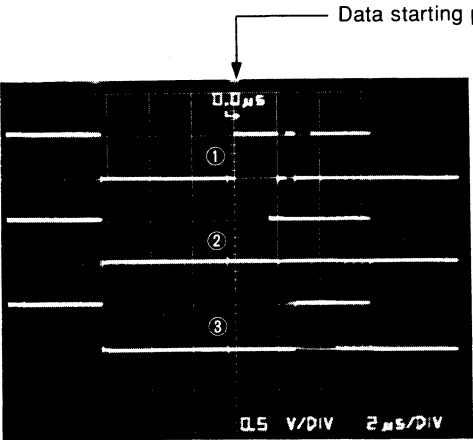
[Fig. 20]

MEASUREMENTS AND ADJUSTMENTS

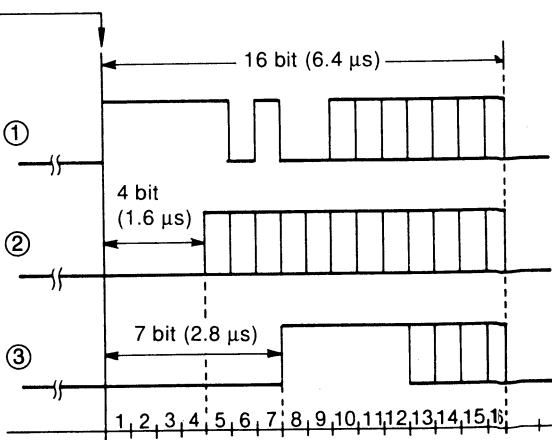
■ Measuring Equipment

- Oscilloscope 20 MHz, 10:1 probe/1:1 probe

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT POINT(S)	READING
D/A Converter offset	any position	Oscilloscope	MAIN P.C.B.	VR1	Checkpoint A	0V $\pm$ 5 mV
	1. Set the oscilloscope voltage division to 5 mV/cm (Use the 1:1 oscilloscope probe) and connect the oscilloscope probe to MAIN P.C.B. Checkpoint A. 2. Turn VR1 to adjust the voltage to zero.					
DRV bias	any position	Oscilloscope	MAIN P.C.B.	VR2	Checkpoint B, C	Photo-A Fig. A
	1. Connect the oscilloscope channel 1 to MAIN P.C.B. checkpoint B and connect the oscilloscope external trigger to MAIN P.C.B. checkpoint C. (Set the oscilloscope CH1 triggering with EXT in.) 2. Turn VR2 on the MAIN P.C.B. fully counter-clockwise and set the data starting point to the oscilloscope division scale to facilitate adjustment in next procedure. (See photo A-①.) 3. Confirm that the first 4 bits (or 5 bits) are low when VR2 is turned fully clockwise. (See photo A-②, Fig. A-②.) 4. Gradually turn VR2 counter-clockwise and make the first 7 bits (2.8μs) turn to low. (See photo A-③, Fig. A-③.)					



[Photo-A]



[Fig. A]

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of the musical tone signals shown may differ somewhat due to the difference in the timing of the triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).
3. This Electronic Organ has a touch-sensitive type keyboard. Therefore the touch sensor level must be set to the "0" level when checking waveform measurements after activating the initial setting.
 - Initial setting method
 - (1) Turn off the **POWER** button.
 - (2) While pressing the three leftmost buttons in the **RHYTHM** section (**8 BEAT**, **ROCK** and **16 BEAT 1**) at the same time, turn the **POWER** button on again.
 - Touch sensitivity setting method
 - (1) Press and hold the **TOUCH** button for the **UPPER SOUND SELECT** or **LOWER SOUND SELECT** until the display changes (2 or 3 seconds).
 - (2) Use the **TRANSPOSE** buttons to set the touch sensitivity level to "0".

■ Important safety notice:

Components identified by a  mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

■ Symbolic marks

The symbolic marks for resistors and capacitors used in these circuits are classified following TABLE-1 and TABLE-2.

1. RESISTORS

- Resistors without a symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
- All resistors are 1/4 WATT, $\pm 5\%$ TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD__F__type)		Fixed Metal Film Resistors "FLAME-PROOF" (ERX__type)
	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF__type)		Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ__type)
	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG__type)		Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC__type)
	Fixed Metal Film Resistors (Precision and High Stability) (ERO__type)		

2. CAPACITORS

- Capacitors without a symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, $\pm 10\%$ Tolerance)
- Polarized capacitors without a symbolic mark are Aluminum Electrolytic Capacitors. (ECEA-type, $\pm 20\%$ Tolerance)

(TABLE-2)

SYMBOL	SPECIFICATION	TYPE
	Non-Polarized Electrolytic Capacitors	ECEA__KN__type
	Non-Polarized Electrolytic (for Network System)	ECEA__Y__type
	Aluminum Electrolytic Capacitors (Low leakage current type)	ECEA__M__type
	Aluminum Electrolytic Capacitors (Low impedance type)	ECEA__Z__type
	Tantalum Solid Electrolytic Capacitors	ECS__type
	Metalized Plastic Film Capacitors (TF Series)	ECQV__type
	Polyester Film Capacitors	ECQB__type
	Temperature Compensating Ceramic Capacitors	ECC__type
	High-Dielectric Constant Ceramic Capacitors	ECK__type ECR__type
	Ceramic Capacitors (Cylinder type)	ECBA__type
	Metalized Polyester Film Capacitors for Across the Line	ECQ__EW__type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES__type

ERROR DISPLAY

When using the Digital Disk Recorder any of the following error messages may appear on the display. If an error message appears, follow the appropriate steps to remedy the problem.

Display	Remedy
oth Fd	The memory disk has not been formatted by the Digital Disk Recorder. • Insert a correctly formatted disk.
L Err	Loading failure. • Perform the loading procedure again.
no Fd	No memory disk in the Digital Disk Recorder. • Insert a memory disk.
no SnG	You have attempted to load a song number which has not been saved. • Load a song number which has been saved.
no ddr	No Digital Disk Recorder.
S Err	Saving failure. • Perform the saving procedure again.
Prt Er	The memory disk is write-protected. • Close the write-protect window of the disk.
Fd FUL	No remaining memory storage capacity. • Insert a new disk, and perform the save procedure after formatting it.
F Err	Formatting failure. • Perform the formatting procedure again.
P Err 1	You have attempted to save a song which is copy-protected. • A copy-protected song cannot be saved.

Warning:

- Some pre-recorded disks (for example, those recorded by the manufacturer) are copy-protected. Data from these disks cannot be copied.
- When the power is turned off after a copy-protected song has been loaded, the **SEQUENCER** contents will be erased.
- If a copy-protected song has been loaded and you want to then record a new song in the **SEQUENCER** and save it on a disk, be sure to first turn the power off once or perform the initialization procedure.

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Technics Organ but do not indicate trouble.

	Symptom	Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the POWER button once, then turn it on again. If this procedure is not successful, turn off the POWER button once. Then, while pressing the three lower left buttons in the RHYTHM section at the same time, turn the POWER button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.)
	No sound is produced when the keys are pressed.	• The MAIN VOLUME is at the minimum setting. Adjust the volume with the MAIN VOLUME control. • The DEMO button is on. ("—" is shown on the display.) Press the DEMO button to turn it off. The display returns to the normal performance display. • The volumes for the selected parts are set to the minimum levels. Use the VOLUME buttons to set the volumes of the relevant parts to appropriate levels. • The LOCAL CONTROL for a part performed on the keyboard is set to OFF. Set the LOCAL CONTROL to on.
	Only percussive instrument sounds are produced when the lower keyboard is played.	• The KEYBOARD PERCUSSION button is on. Turn it off to return the keyboard to the normal sound.
	When the TAB & ORGAN is selected, it does not sound.	• If all the FLUTE and PERC buttons are off while the TAB (FLUTE) is selected, it does not sound. Turn on a FLUTE or PERC button to select the sound.
	The sound of the lower keyboard or pedal keyboard does not stop.	• This occurs if the lower keyboard is played when the FINGERED 1 or 2 and the MEMORY buttons are on. Turn off the MEMORY button.
	The foot switch does not operate properly.	• Any function is storable in the foot switch. The default setting is for the glide control. Store your favorite function.
Rhythm	The rhythm does not start.	• The DRUMS volume is set to the minimum level. Use the VOLUME buttons to set the DRUMS volume to an appropriate level. • The MIDI CLOCK is set the external clock (ON). Set the MIDI CLOCK to the internal clock (OFF). • In the RHYTHM section, a COMPOSER number button with no stored pattern was selected. Change the rhythm or store a new rhythm pattern in the COMPOSER.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• An ACCOMP part does not sound if its corresponding volume is set to the minimum level. Use the VOLUME buttons to set the ACCOMP volume to appropriate levels.
	No sound is produced for the automatic accompaniment.	• In the RHYTHM section, a COMPOSER number button with no stored pattern was selected. Change the rhythm or store a new rhythm pattern in the COMPOSER.

Symptom		Remedy
SEQUENCER	Storage is not possible.	The remaining memory capacity of the SEQUENCER is 0. Follow the SONG CLEAR or TRACK CLEAR procedure to erase the memory.
	Multi-track storage is not possible.	The playback track has been selected, but the START/STOP button has not been pressed. A flashing track indicator shows the track which is ready for recording, and a lit track indicator shows a track which is ready for playback. To record one track while listening to another (playback) track, press the START/STOP button to begin playback.
COMPOSER	Storage is not possible.	The remaining memory capacity of the COMPOSER is 0. Erase a different COMPOSER number button in the RHYTHM section in which a pattern is stored.
	Setting the time signature and number of measures is not possible.	The time signature and number of measures cannot be changed for a pattern which is currently recorded in the COMPOSER. If you wish to change the time signature and/or measure data, first follow the procedure to clear the memory.
	The playback timing of the rhythm pattern is different from the timing with which it was recorded.	The QUANTIZE function was on when the pattern was recorded and the timing was automatically corrected. Set the QUANTIZE level to a smaller note unit or to OFF when recording.
Digital Disk Recorder (Option)	The Digital Disk Recorder produces a noise during recording or playback.	This occurs when the Digital Disk Recorder is reading a disk. It does not indicate a problem.
	When the procedure to load from a memory disk is performed, the contents of the SEQUENCER memory are erased.	When performing the load operation from a memory disk, the SEQUENCER memory changes to that of the data loaded from the memory disk. If you wish to preserve a song which is stored in the SEQUENCER memory, save it in a memory disk before performing the load procedure.

MIDI IMPLEMENTATION CHART

Organ
[SX-EN1/EN2/EN3/EN4] (Transmitted)

Function		UPPER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN1/EN4)	LOWER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN4)	ACCOMP 1, 2, 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1 (POLY), 4 (SOLO) 1~16	2 1~16	5 (1), 9 (2), 10 (3) 1~16	3 1~16	15 1~16	16 1~16	(EN1) memorized (EN2/EN3/EN4)
	Changed	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	(EN1) (EN2/EN3/EN4)
Mode	Default	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	—	Changes depending on the position of the transpose control and octave shift.
	True voice	—	—	—	—	—	—	
Velocity	Note ON	× ○	× ○	○* ○**	○* ○**	○* ○	—	(EN1) (EN2/EN3/EN4)
	Note OFF	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	—	
After Touch	Key's	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	
Pitch Bender		○*	○*	○*	○*	×	×	
Control Change	1	×	×	○*	○*	×	×	modulation
	7	○	○	○	○	○	○	volume (main volume)
	11	×	×	×	×	×	○	expression pedal
	64	○	○	○	○	×	×	sustain
	80	×	○**	×	×	×	×	auto play chord
	82	×	×	×	×	○	×	intro, fill in, ending
	92	○**	○**	×	×	×	×	tremolo
	94	○	○	○	○	×	×	effect
Prog Change		○×	○×	○×	○×	○×	×	
	True #	—	—	—	—	—	—	
System exclusive		×						
System common	Song Pos	×						0~19
	Song Sel	× (EN1/EN2) ○× (EN3/EN4)						
	Tune	×						
System Real Time	Clock	○						start/stop, continue
	Commands	○×						
Aux Messages	Local ON/OFF	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	—	
	Active Sense	○						
	Reset	×						
Notes		○* AUTO PLAY CHORD pattern only ○** POLY part only ○*** AUTO PLAY CHORD or SEQUENCER PLAY only ○× Whether or not the data for each of these items is transmitted can be set.						

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes
Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

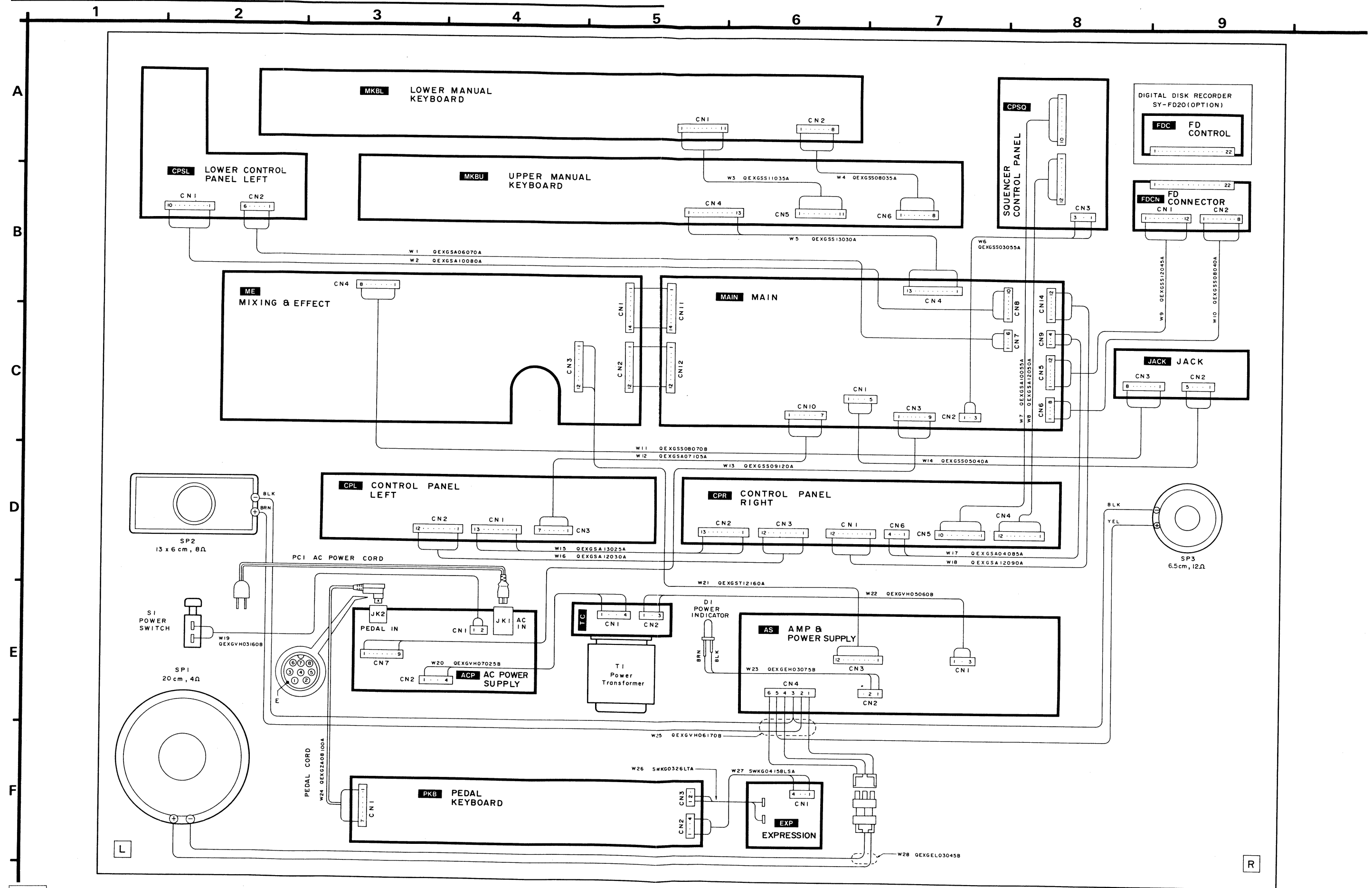
Organ
[SX-EN1/EN2/EN3/EN4] (Recognized)

Function		UPPER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN1/EN4)	LOWER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN4)	ACCOMP 1, 2, 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1 (POLY), 4 (SOLO) 1~16	2 1~16	5 (1), 9 (2), 10 (3) 1~16	3 1~16	15 1~16	16 1~16	(EN1) memorized (EN2/EN3/EN4)
	Changed	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	(EN1) (EN2/EN3/EN4)
Mode	Default	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	—	Changes depending on the position of the transpose control and octave shift.
	True voice	0~127	0~127	0~127	0~127	48~81	—	
Velocity	Note ON	○	○	○	○	○	—	
	Note OFF	×	×	×	×	×	—	
After Touch	Key's	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	
Pitch Bender		○	○	○	○	×	×	
Control Change	1	○	○	× (EN1/EN2) ○* (EN3/EN4)	× (EN1/EN2) ○* (EN3/EN4)	×	×	modulation
	7	○	○	○	○	○	○	volume (main volume)
	11	×	×	×	×	×	○	expression pedal
	64	○	○	○	○	×	×	sustain
	80	×	○**	×	×	×	×	auto play chord
	82	×	×	×	×	○	×	intro, fill in, ending
	92	○**	○**	×	×	×	×	tremolo
	94	○	○	○	○	×	×	effect
Prog Change		○×	○×	○×	○×	○×	×	
	True #	0~9 0~9 0~13	0~7 0~7 0~9	0~7 0~7 0~9	0~3 0~3 0~4	0~11 0~19 0~21	—	(EN1/EN2) (EN3) (EN4)
System exclusive		×						
System common	Song Pos	×						0~19
	Song Sel	× (EN1/EN2) ○× (EN3/EN4)						
	Tune	×						
System Real Time	Clock	○						start/stop, continue
	Commands	○×						
Aux Messages	Local ON/OFF	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	—	
	Active Sense	○						
	Reset	×						
Notes		○* AUTO PLAY CHORD pattern only ○** POLY part only ○× Whether or not the data for each of these items is received can be set.						

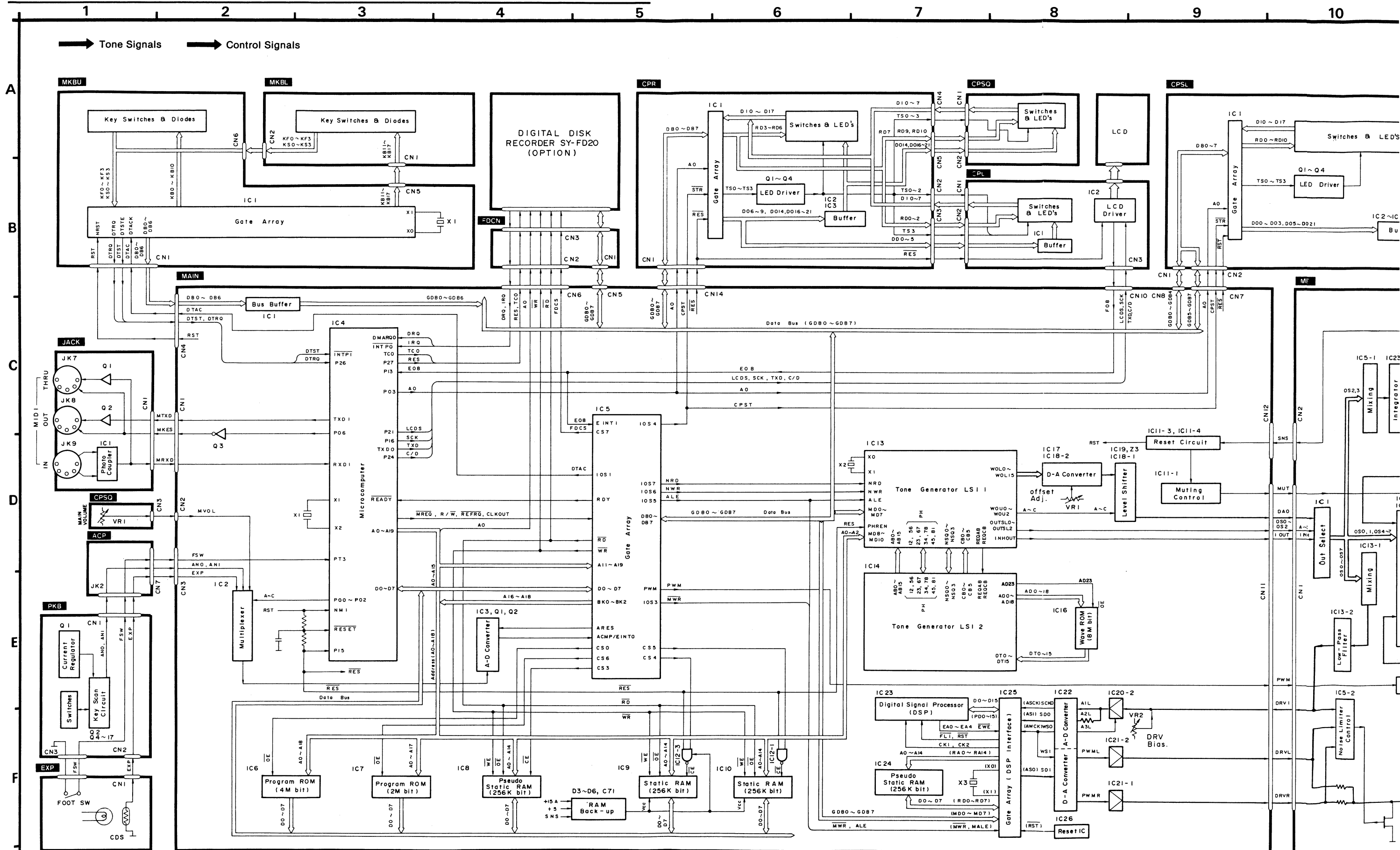
Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO ○: Yes
Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO ×: No

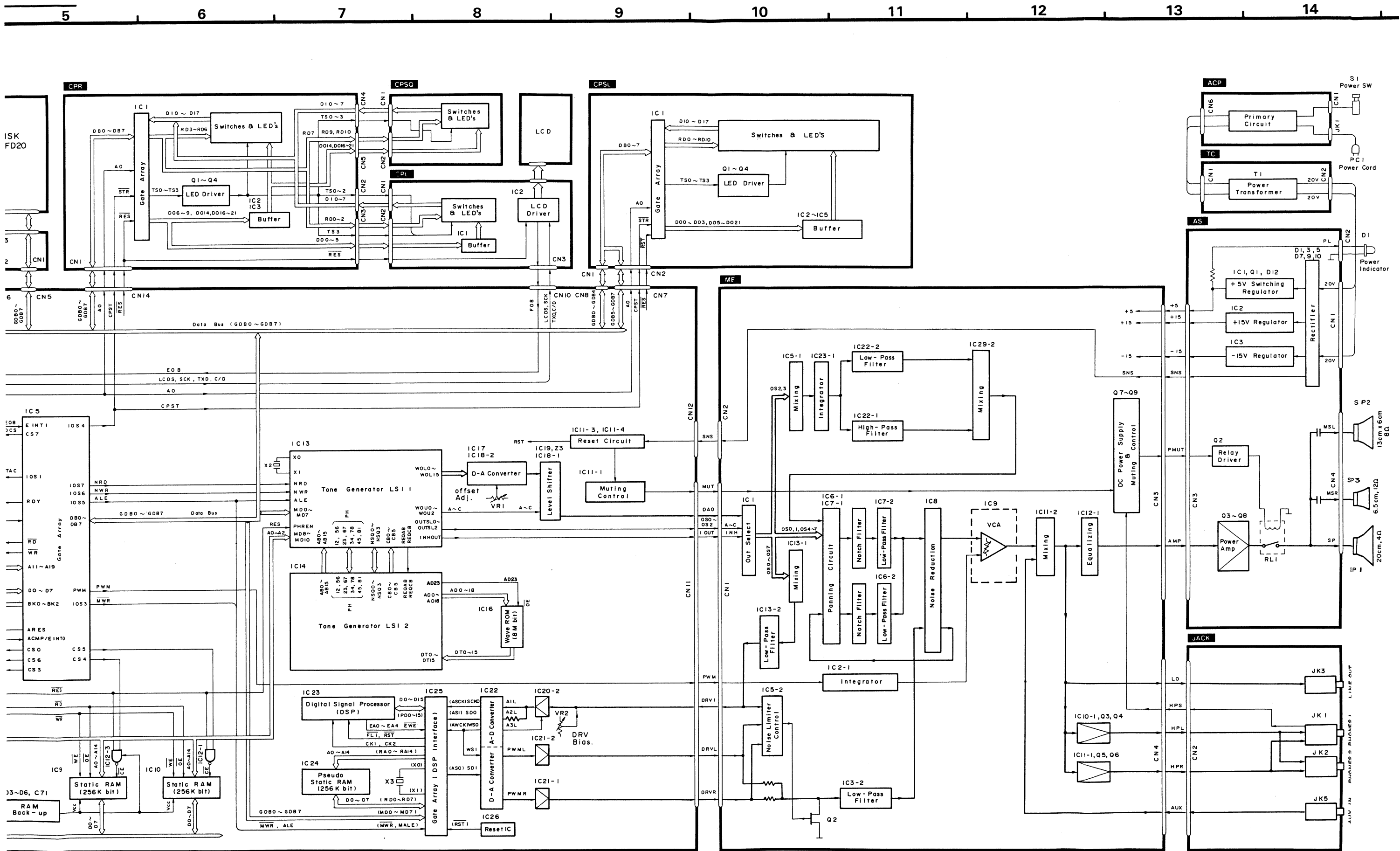
MEMO

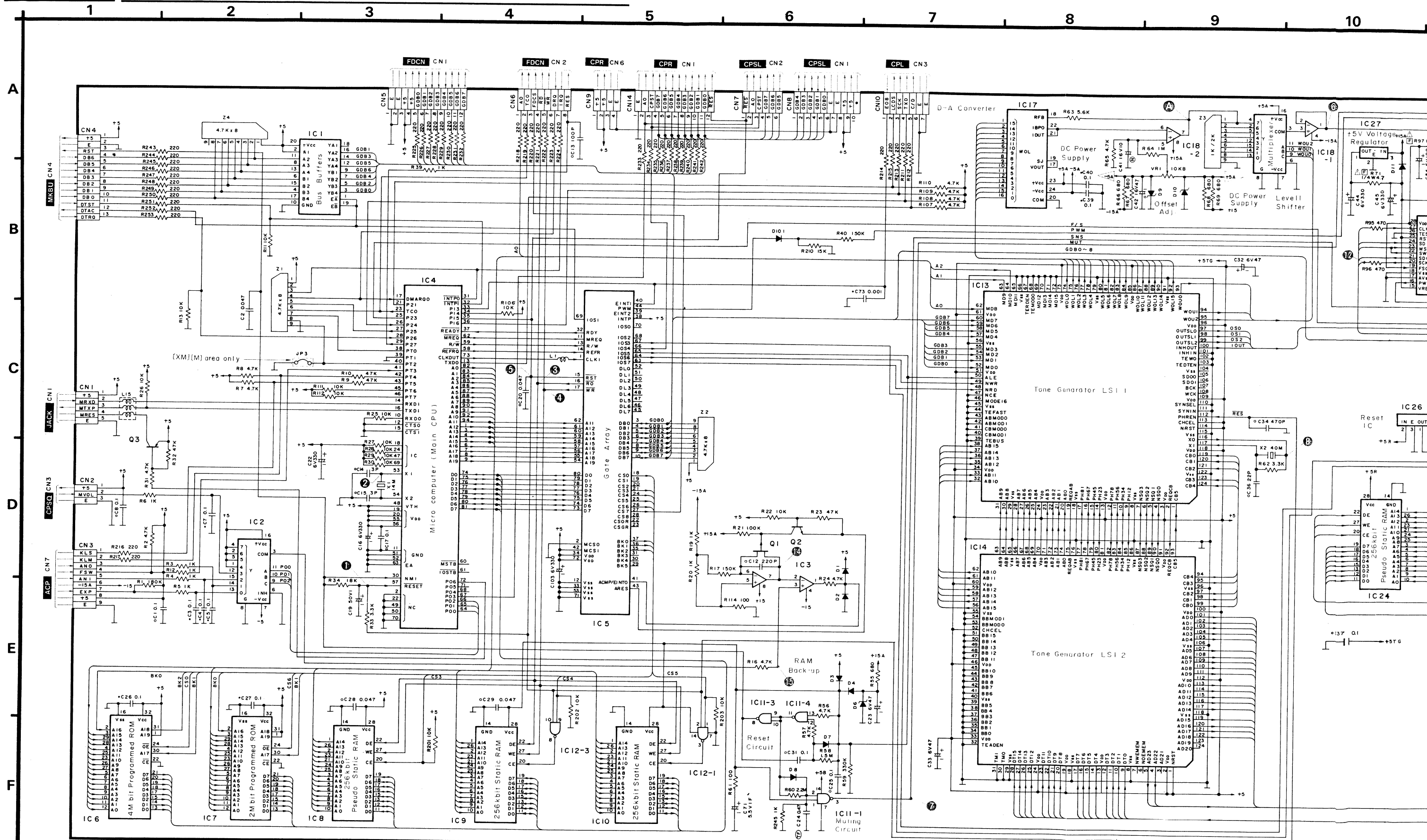
WIRING CONNECTION DIAGRAM

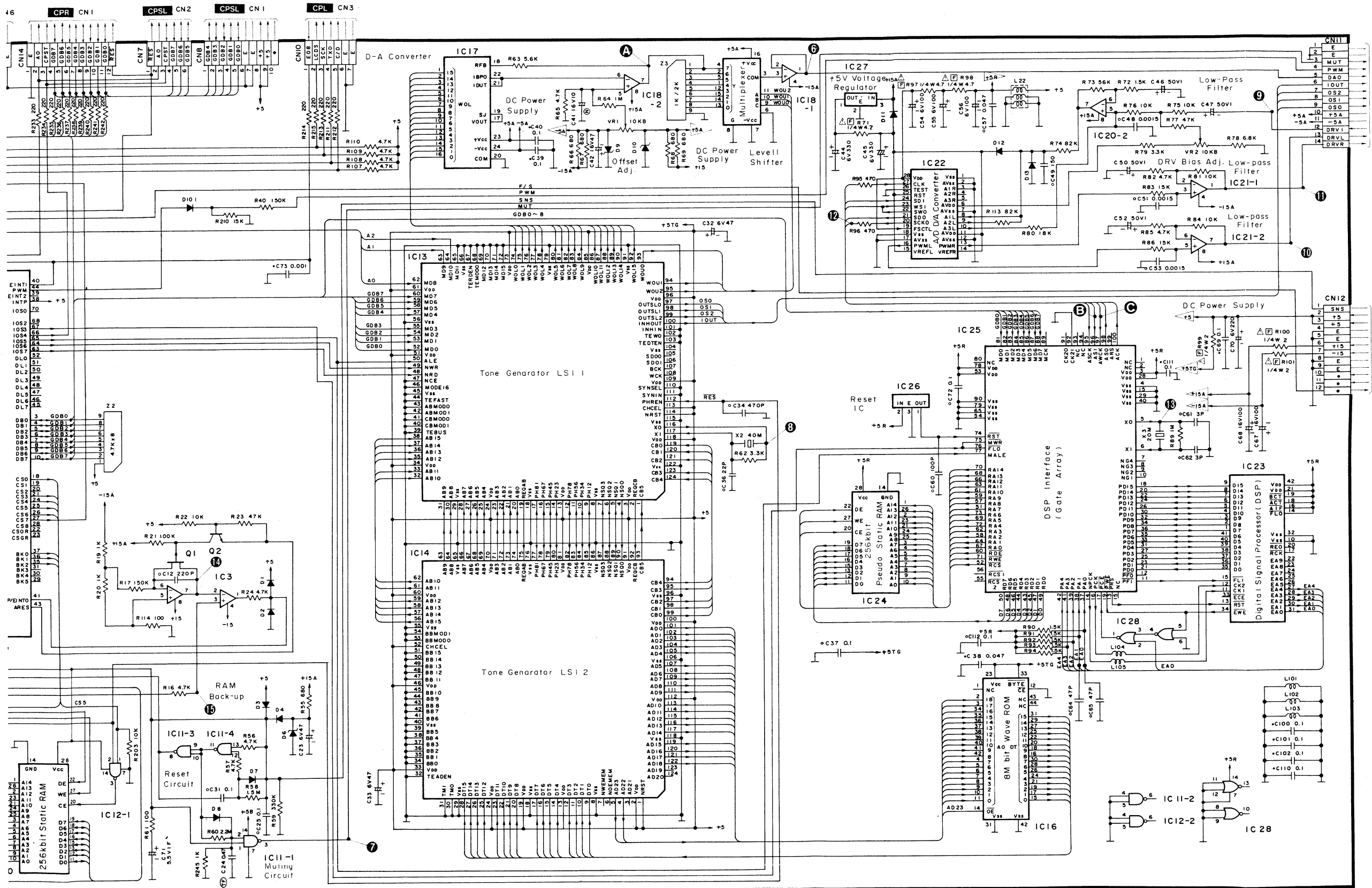


BLOCK DIAGRAM







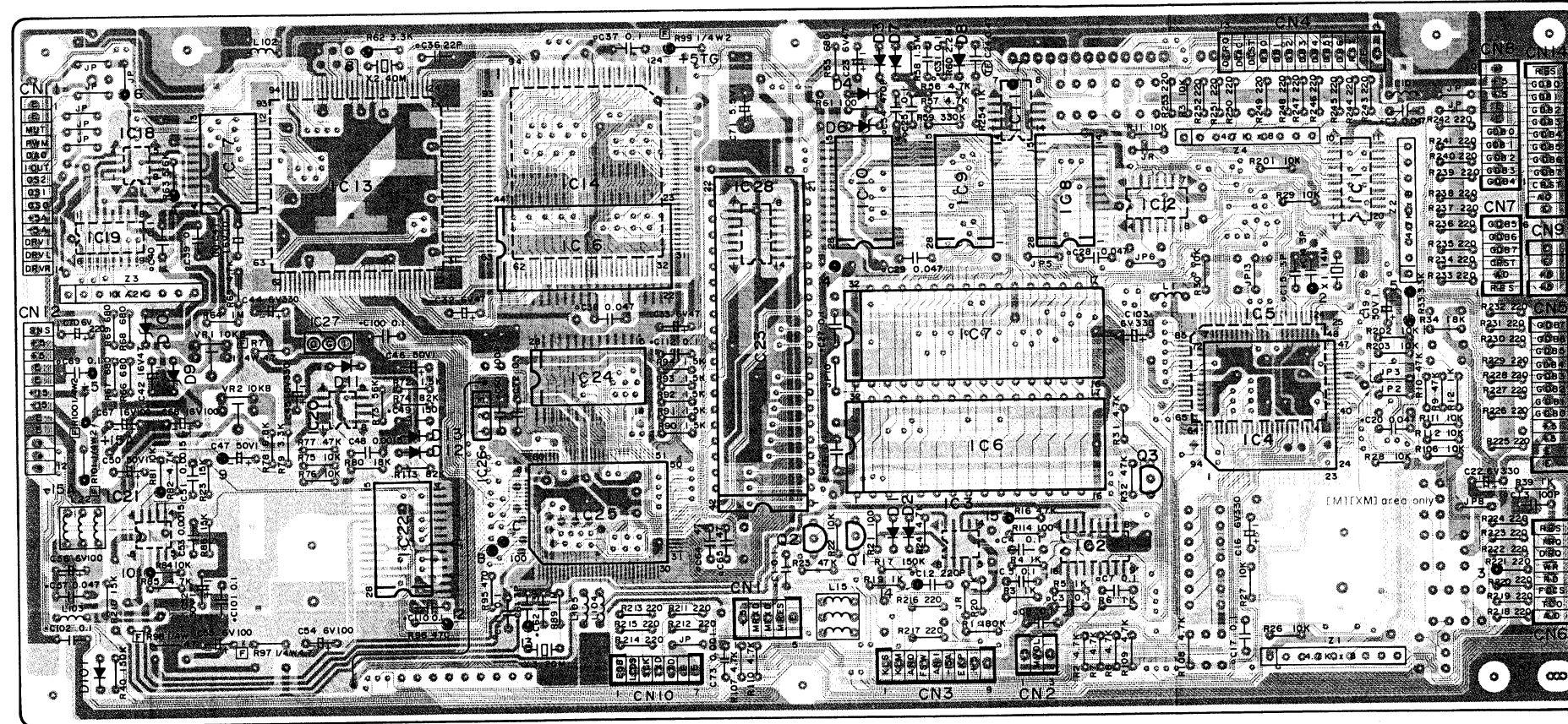


- NOTES:**
- IC'S
 - IC1: M74HC244FP
 - IC2: T74H4051AF
 - IC3: M5238FP
 - IC4: SVIGD70320GJ
 - IC5: D65012GF-A79
 - IC6: QSIGCEN4A70
 - IC7: QSIGH3C0221
 - IC8: HM65256BLF1
 - IC9, 10: M5256BFP12LL
 - IC11, 12: M74HC00FP
 - IC13: MN73012PGC
 - IC14: MN73013PGD
 - IC16: QSIGH3C08092
 - IC17: PCM55HP
 - IC18: M5238FP
 - IC19: T74H4051AF
 - IC20: M5220FP
 - IC21: M5218AFP
 - IC22: MN8305S
 - IC23: SVIG87064073
 - IC24: HM65256BLF10
 - IC25: SVIGMB622416
 - IC26: MN1280R
 - IC27: SVIGM5278U5
 - IC28: M74HC02FP
 - TRANSISTORS
 - Q1: 2SJ105GR
 - Q2: 2SC1815GR
 - Q3: 2SA1015-GR
 - DIODES
 - D1~5, 7, 8, 12, 13, 101: MA165TA5
 - D6: MA4051MTA
 - D9, 10: MA4056H
 - D11: EK04

Circuit view on top of P.C.B.

• [M] [XM] areas SXP2073131

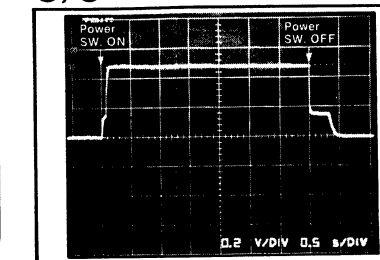
• Other areas SXP2073111



■ Waveform measurement

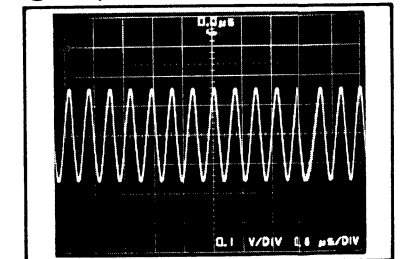
1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the E. organ to required mode followings.
 - UPPER ORCHESTRAL CONDUCTOR TAB & ORGAN
 - UPPER TAB & ORGAN FLUTE 8' ON
 FLUTE 16' 4' 2' OFF
 TREMOLO OFF
 - DIGITAL REVERB STAGE

①, ⑤ RESET

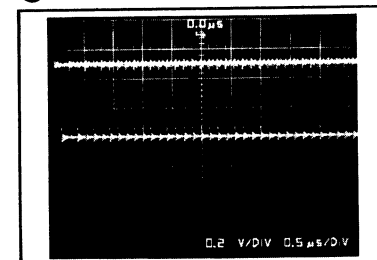


• Power SW. ON→OFF

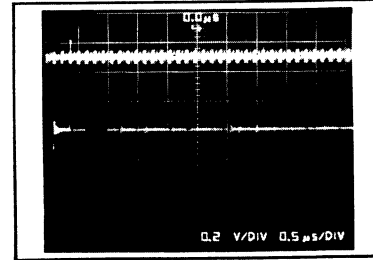
② X1, 14 MHz



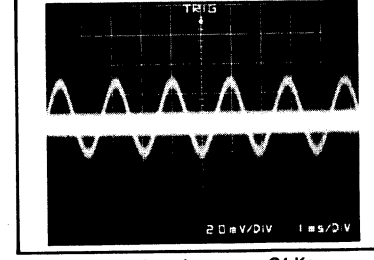
③ RD



④

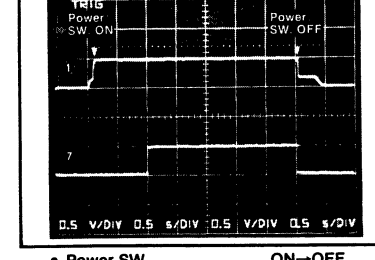


⑥



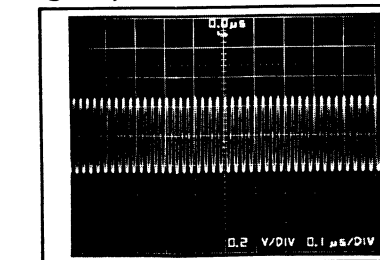
• Upper Keyboard C4 Key

⑦

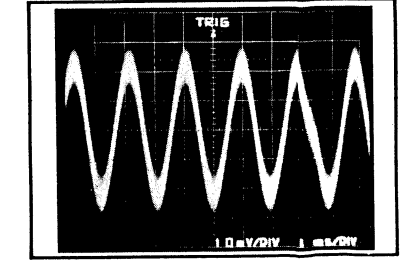


• Power SW. ON→OFF

⑧ X2, 40 MHz

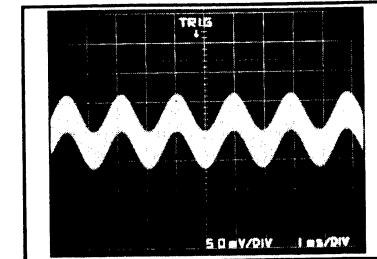


⑨



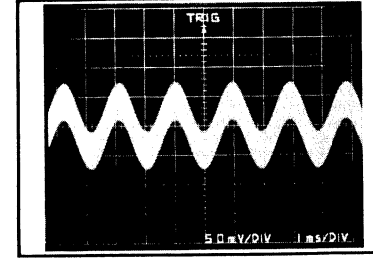
• Upper Keyboard C4 Key

⑩



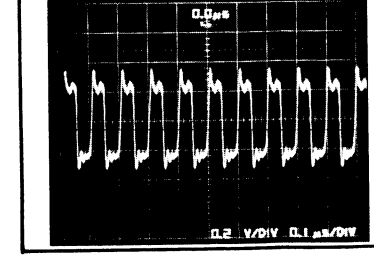
• Upper Keyboard C4 Key

⑪

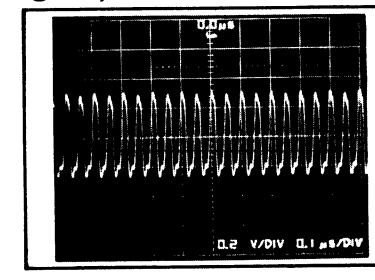


• Upper Keyboard C4 Key

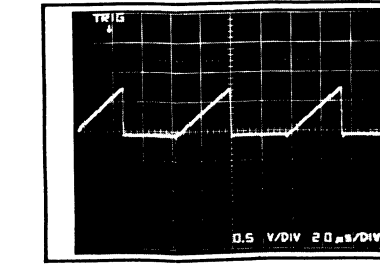
⑫



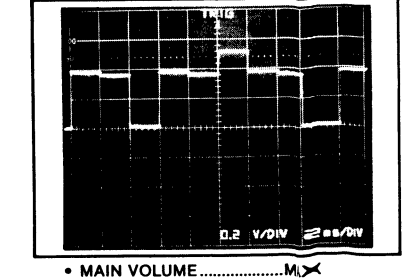
⑬ X3, 20 MHz



⑭



⑮



• MAIN VOLUME M1
 • EXP. PEDAL M1

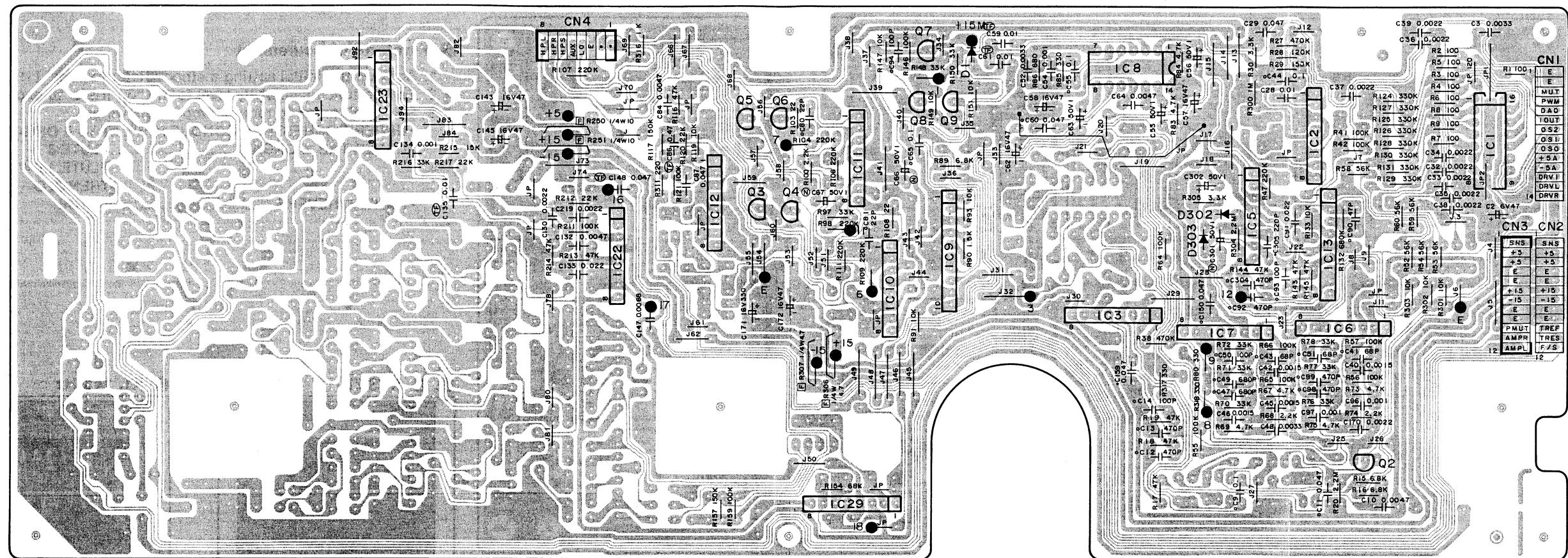
ME

JACK

MIXING & EFFECT AND JACK CIRCUIT BOARD

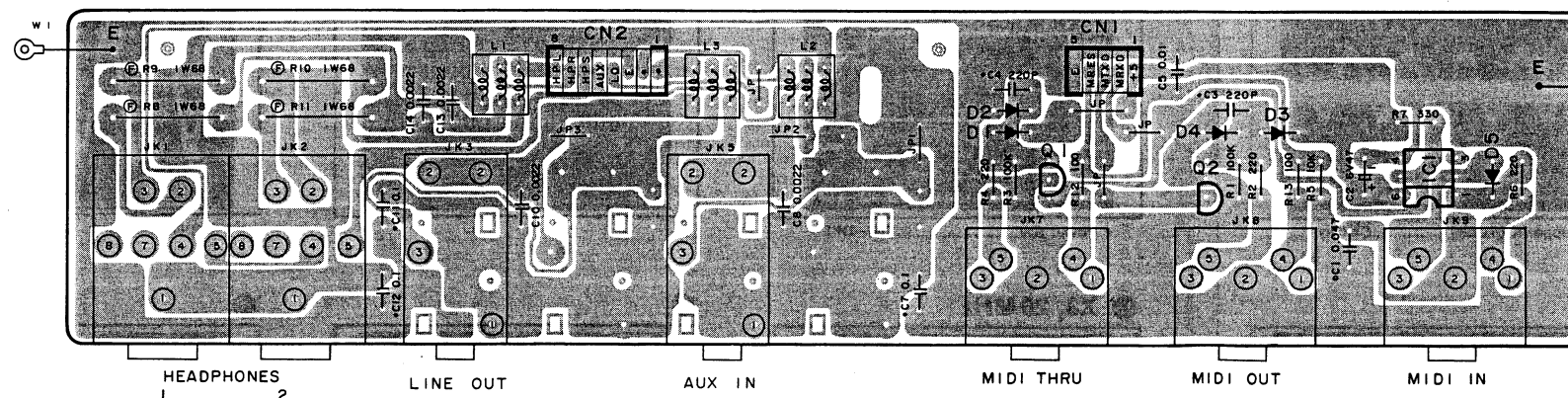
ME

SXPG207521A



JACK

SXPG207521B



JACK

NOTES:

- IC'S
IC1: SVIGTLP513
- TRANSISTORS
Q1, 2: 2SA1015-GR
- DIODES
D1~5: MA165TA5

ME

NOTES:

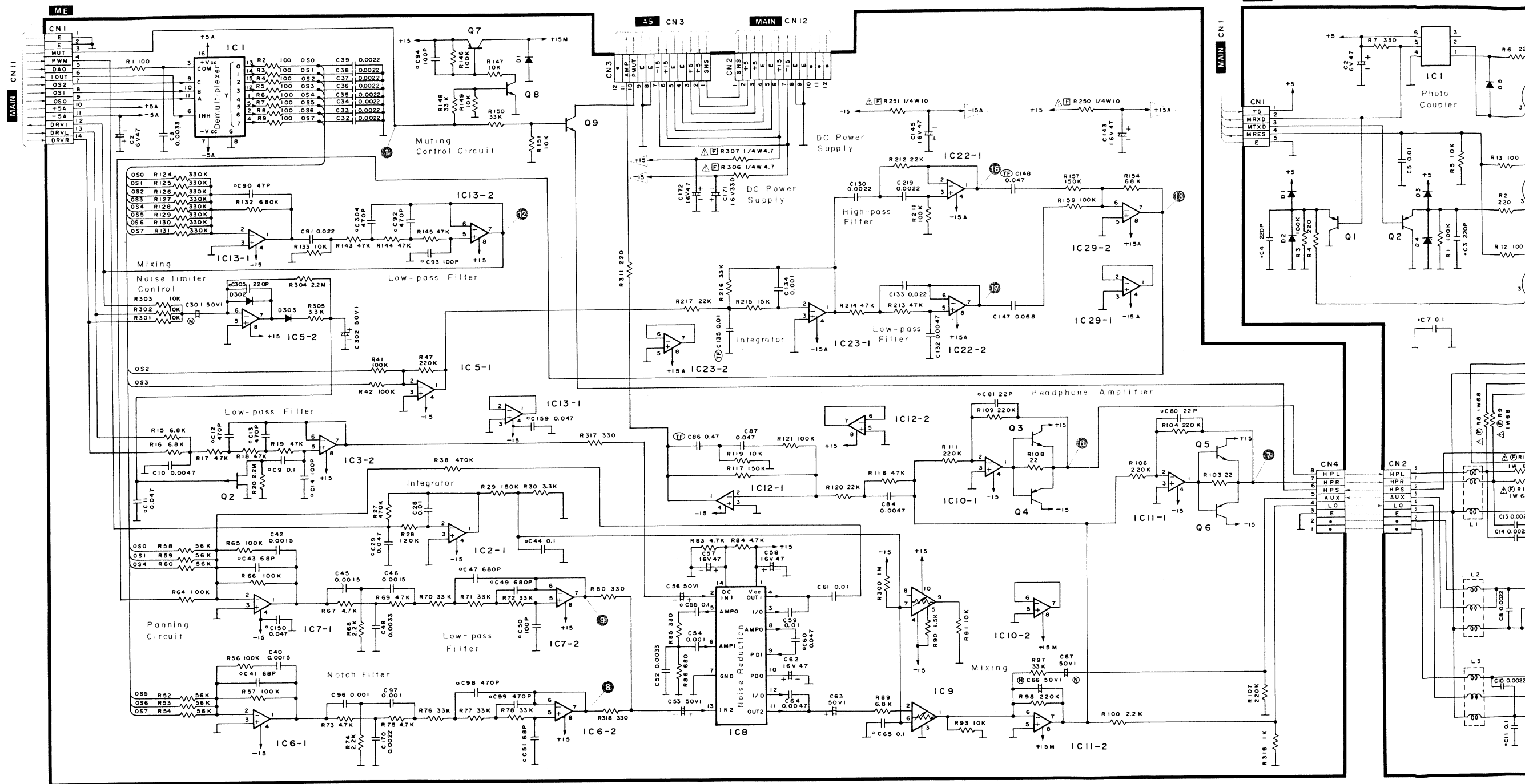
- IC'S
IC1: SVIGT74H4051
IC2, 3, 5~7, 10~13, 22, 23, 29: SVIGM5218L
- IC8: SVIGLM1894N
IC9: SVIGM5241L

• TRANSISTORS

- Q2: 2SJ105GR
- Q3, 5: 2SC340ARS
- Q4, 6: 2SA1134ARS
- Q7: 2SA1115-GR
- Q8, 9: 2SC1115GR

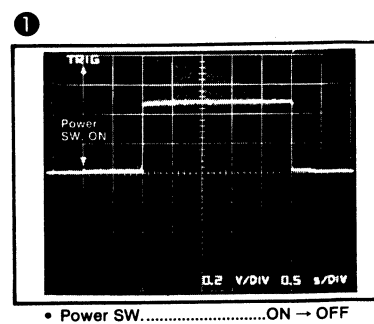
• DIODES

- D1: EK04
- D302, 303: MA16T A5

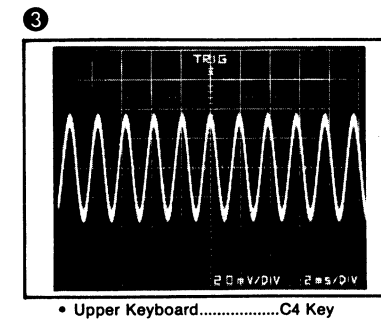


Waveform measurement

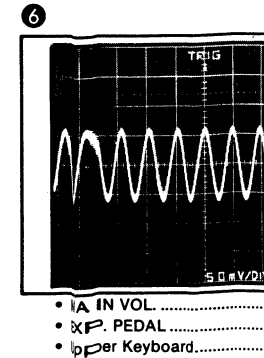
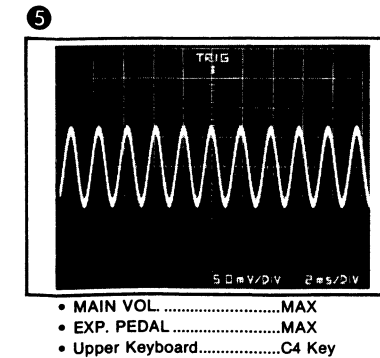
1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the E. organ to required mode followings.
 - UPPER ORCHESTRAL CONDUCTOR.....TAB & ORGAN
 - UPPER TAB & ORGAN.....FLUTE 8' — ON
FLUTE 16' 4' 2' — OFF
TREMOLO — OFF
 - DIGITAL REVERB.....STAGE



II-13

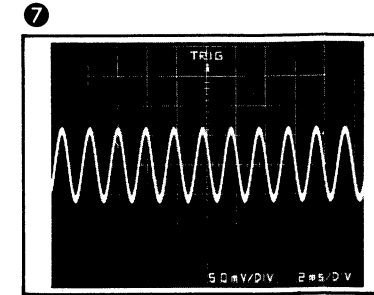
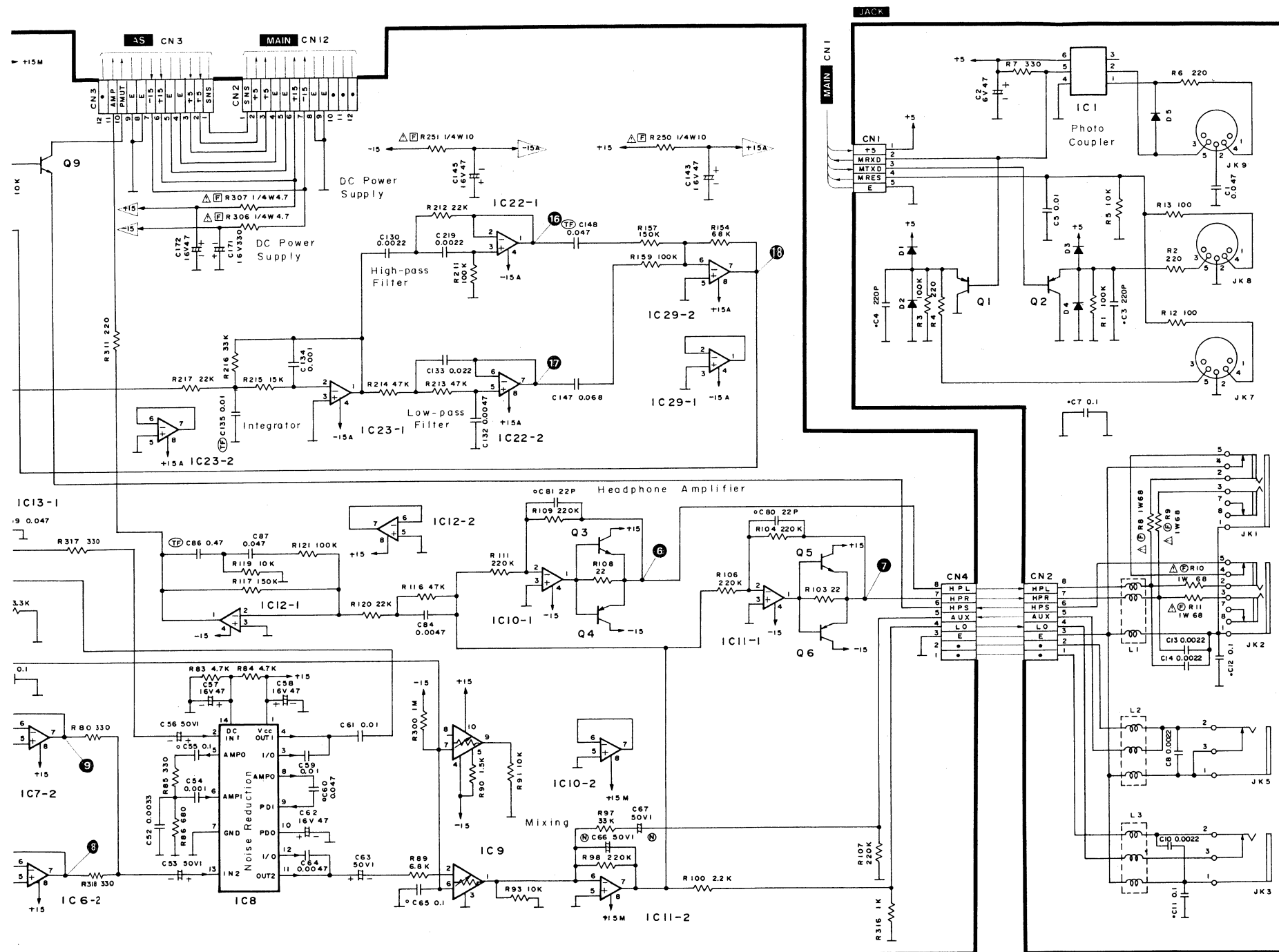


II-14

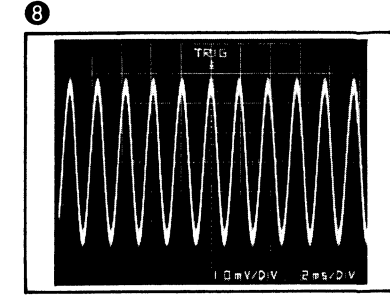


CIRCUIT DIAGRAM

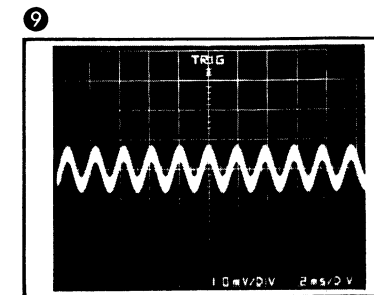
5 6 7 8 9 10 11 12 13 14



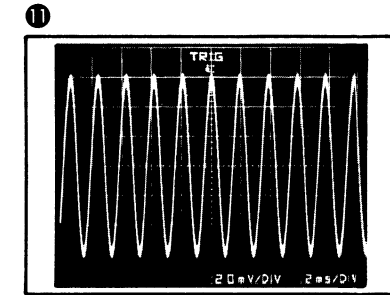
- MAIN VOL. MAX
- EXP. PEDAL MAX
- Upper Keyboard.....C4 Key



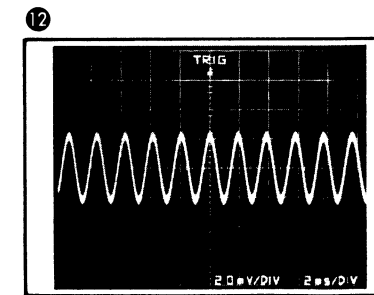
- Upper Keyboard.....C4 Key



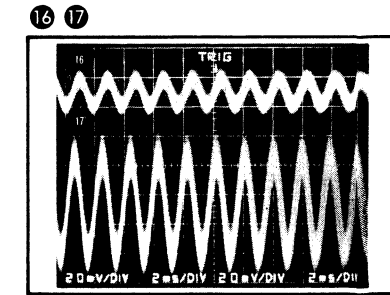
- Upper Keyboard.....C4 Key



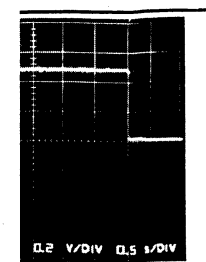
- MAIN VOL. MAX
- EXP. PEDAL MAX
- Upper Keyboard.....C4 Key



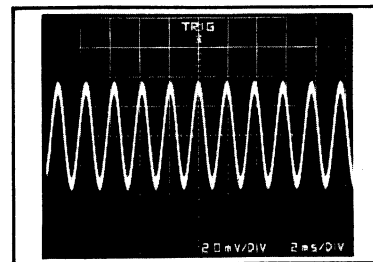
- Upper Keyboard.....C4 Key



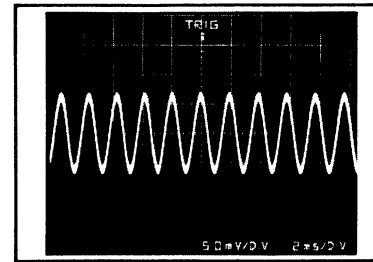
- UPPER TAB & ORGAN TREMOLO- ON
- TREMOLO SLOW/FAST FAST
- Upper Keyboard.....C4 Key



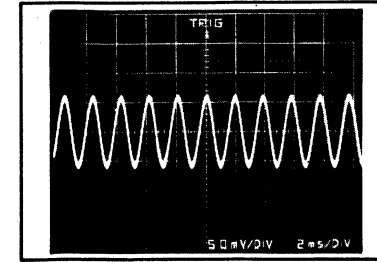
- ON - OFF



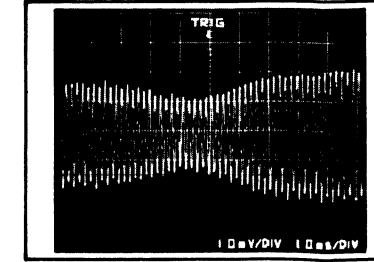
- Upper Keyboard.....C4 Key



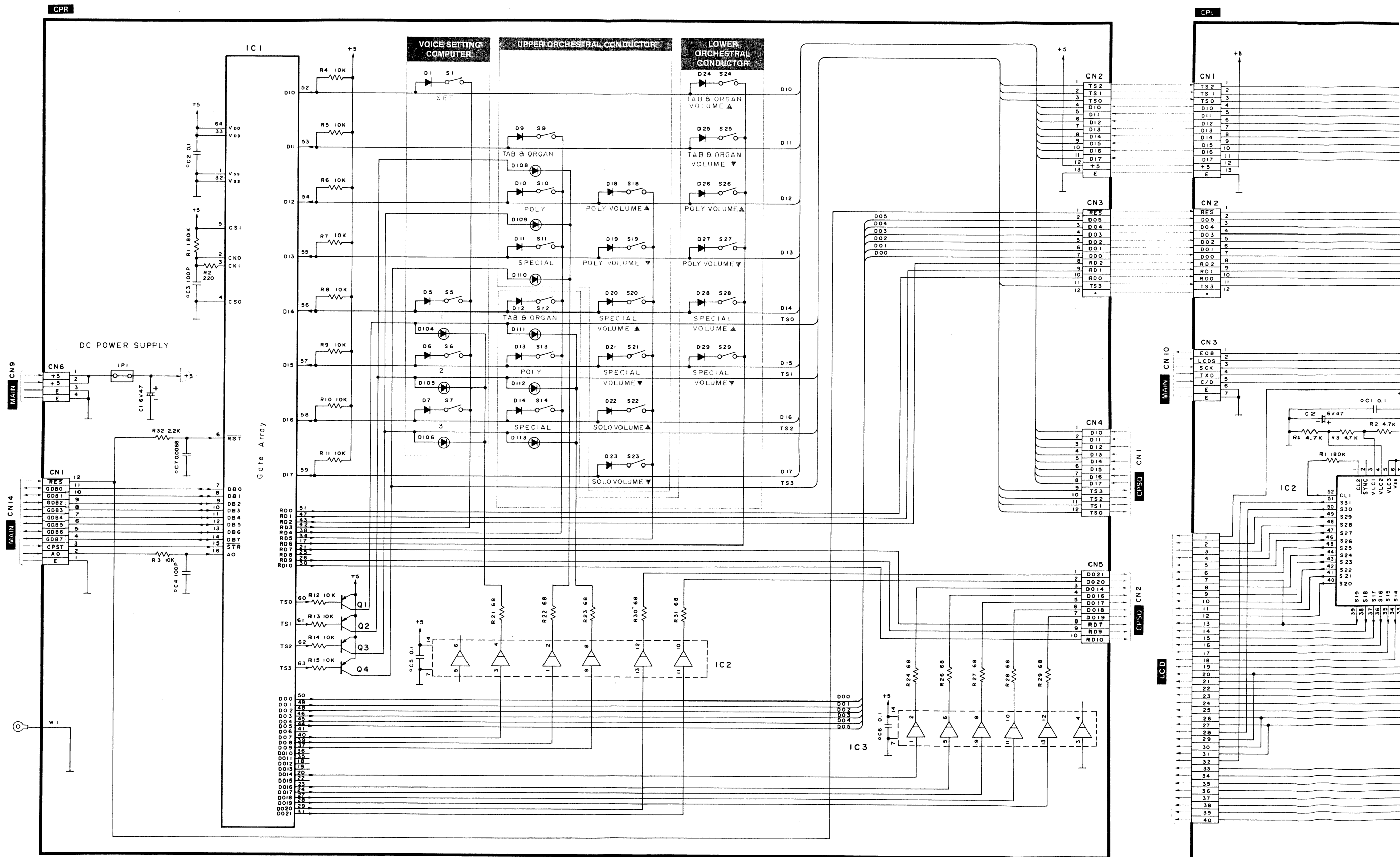
- MAIN VOL. MAX
- EXP. PEDAL MAX
- Upper Keyboard.....C4 Key



- MAIN VOL. MAX
- EXP. PEDAL MAX
- Upper Keyboard.....C4 Key



- UPPER TAB & ORGAN TREMOLO- ON
- TREMOLO SLOW/FAST FAST
- Upper Keyboard.....C4 Key



ID RIGHT CIRCUIT DIAGRAM

5

6

7

8

9

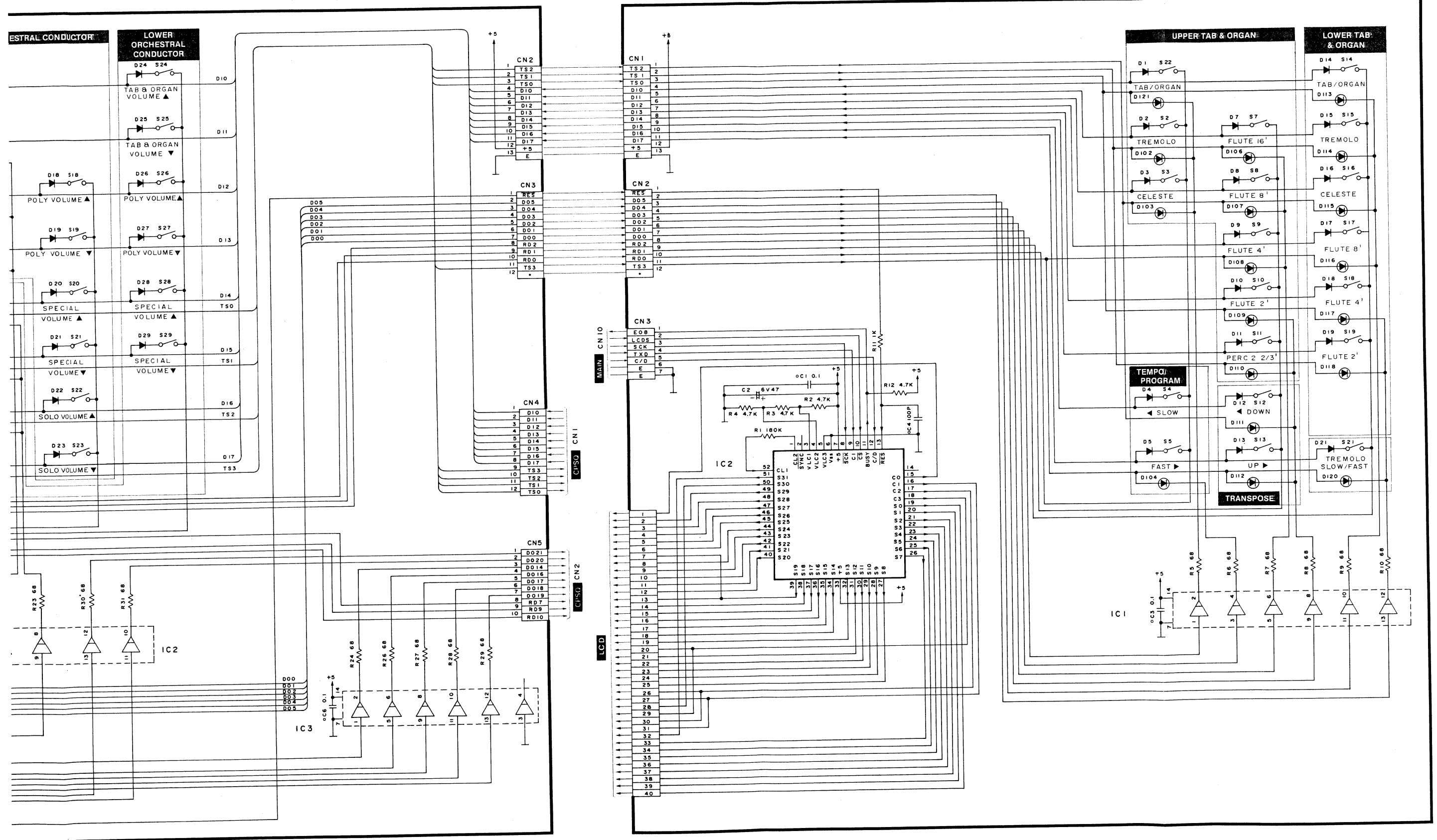
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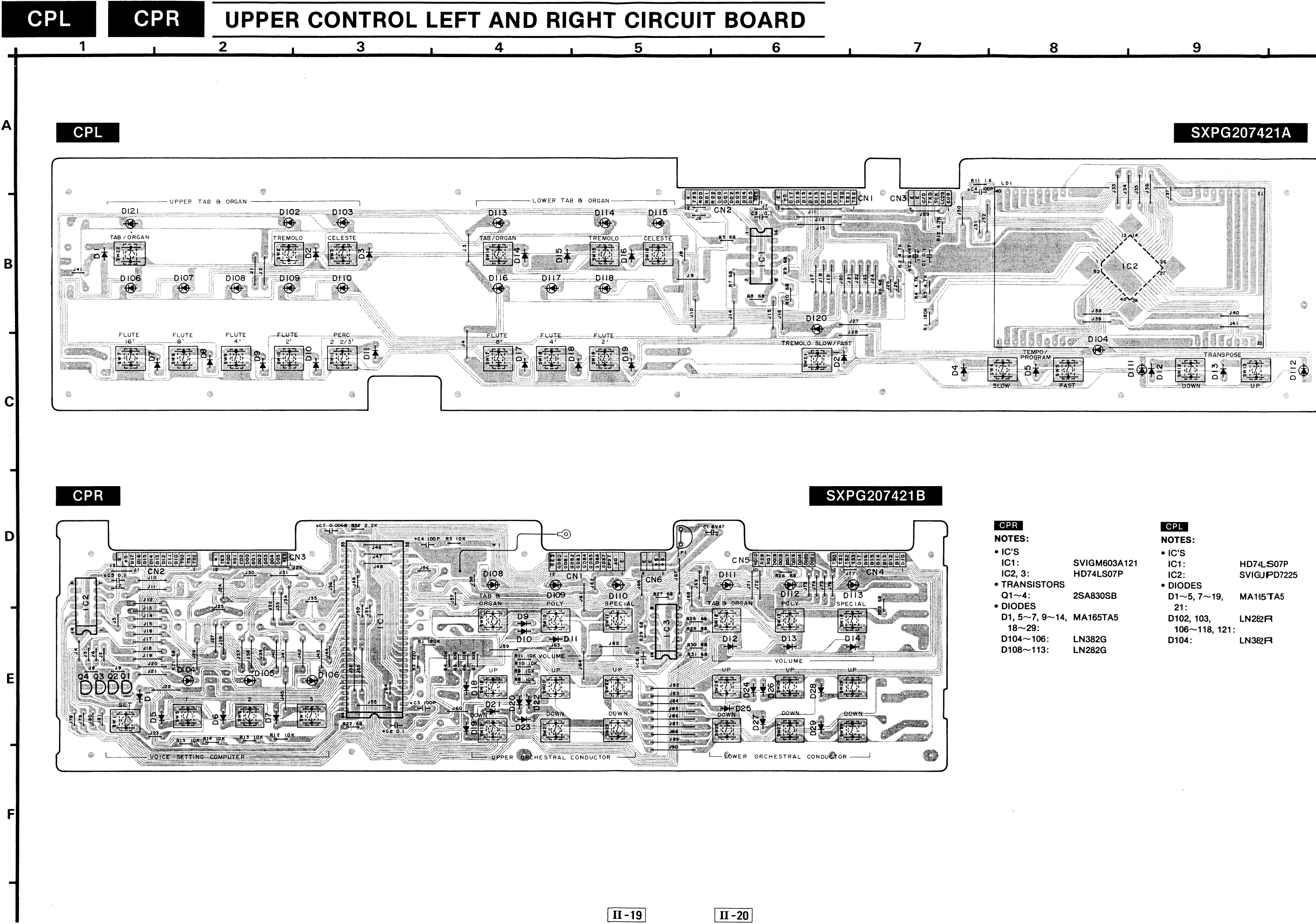
11

12

13

14





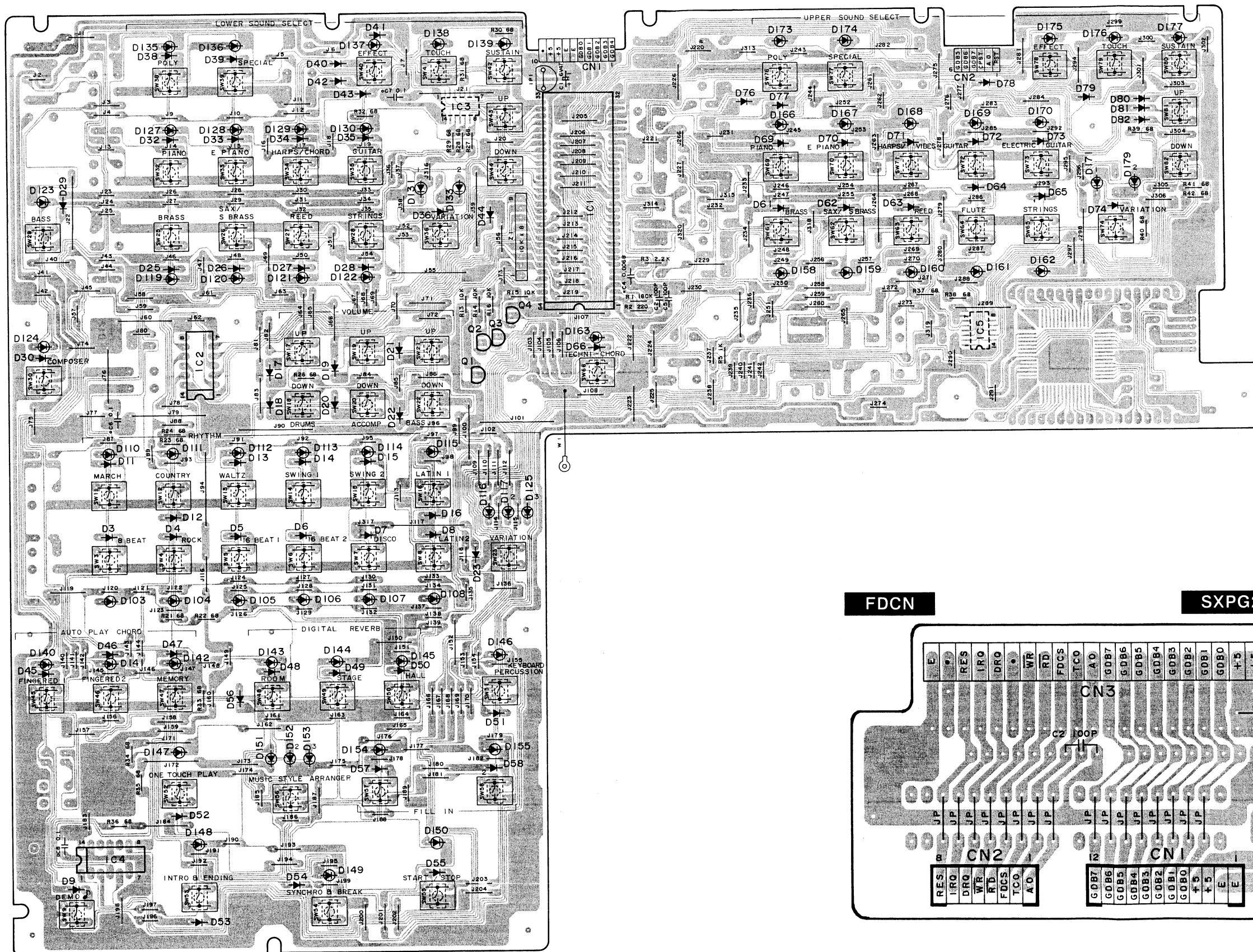
CPSL

FDCN

LOWER CONTROL PANEL LEFT AND FD CONNECTOR CIRCUIT BOARD

CPSL

SXPG207221A



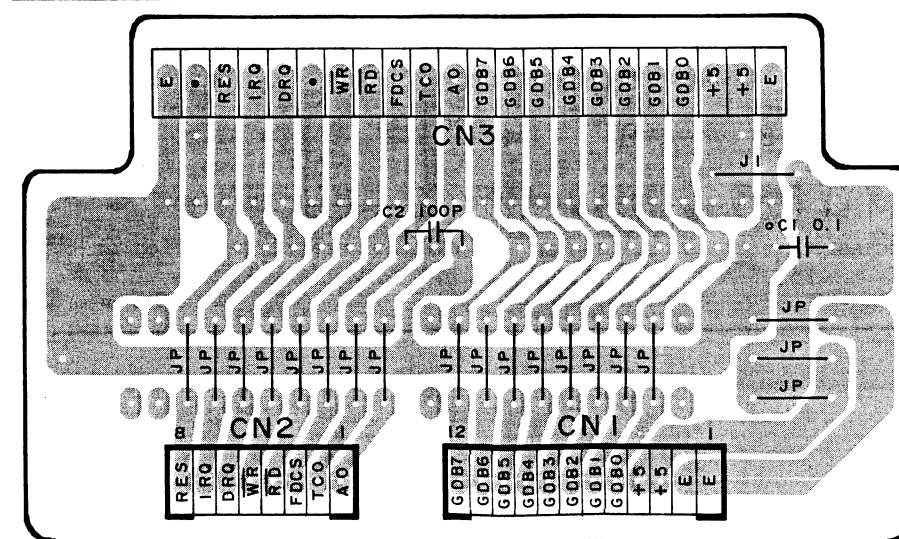
CPSL

NOTES:

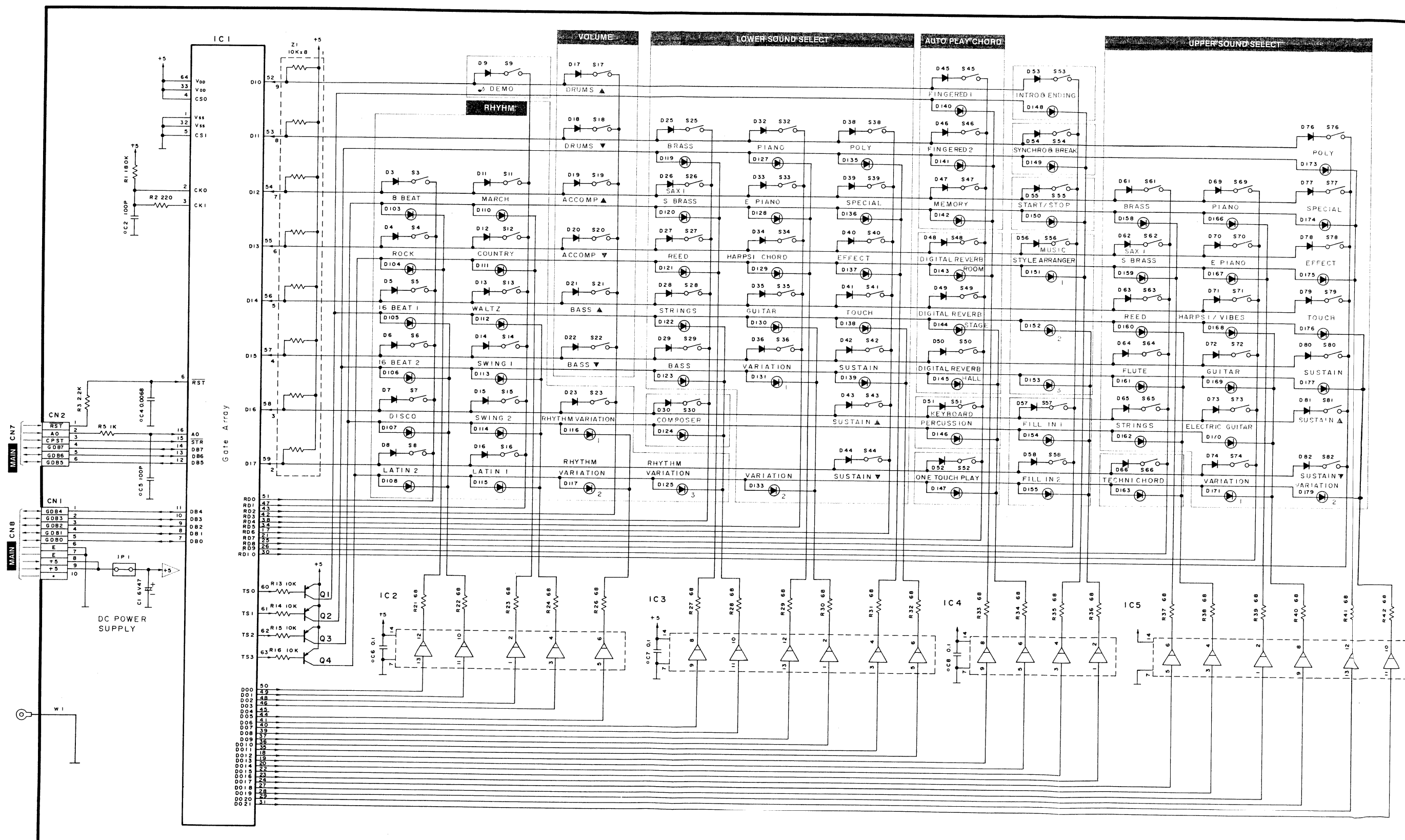
- IC'S
 - IC1: SVIGM603A121
 - IC2, 4: HD74LS07P
 - IC3, 5: M74LS07FP
- TRANSISTORS
 - Q1~4: 2SA830SB
- DIODES
 - D3~9, 11~23, 25~30, 32~36, 38~59, 61~66, 69~74, 76~82: MA165TA5
 - D103~108, 110~117, 119~123, 125, 127~131, 133, 135~146, 148~155, 158~163, 166~177, 179: LN282R
 - D124, 147: LN382G

FDCN

SXPG208811B

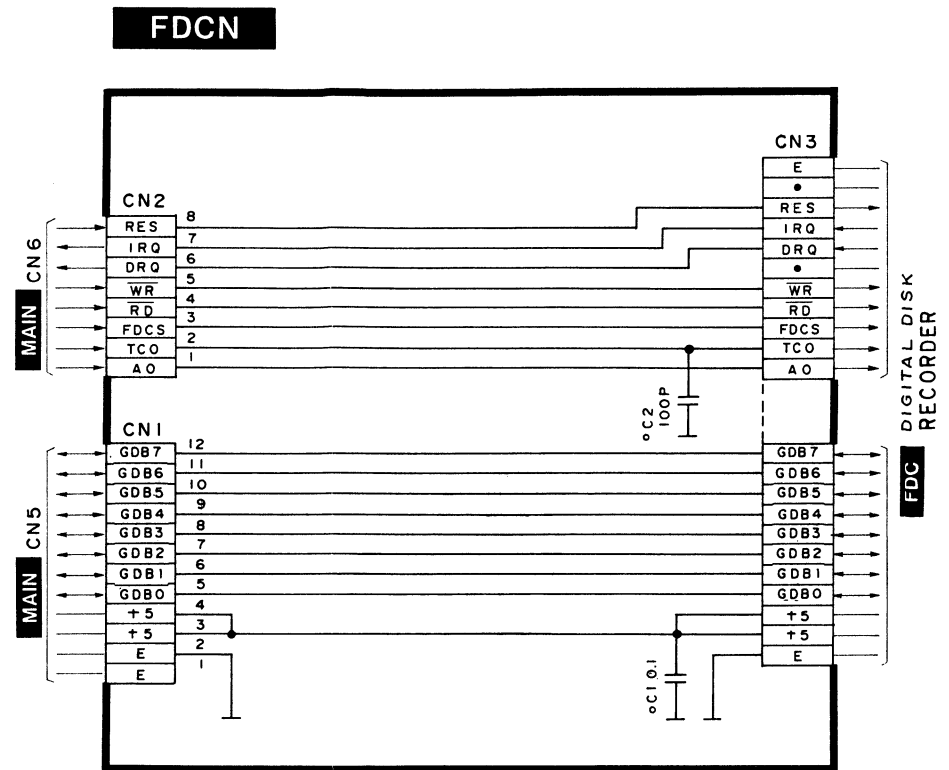
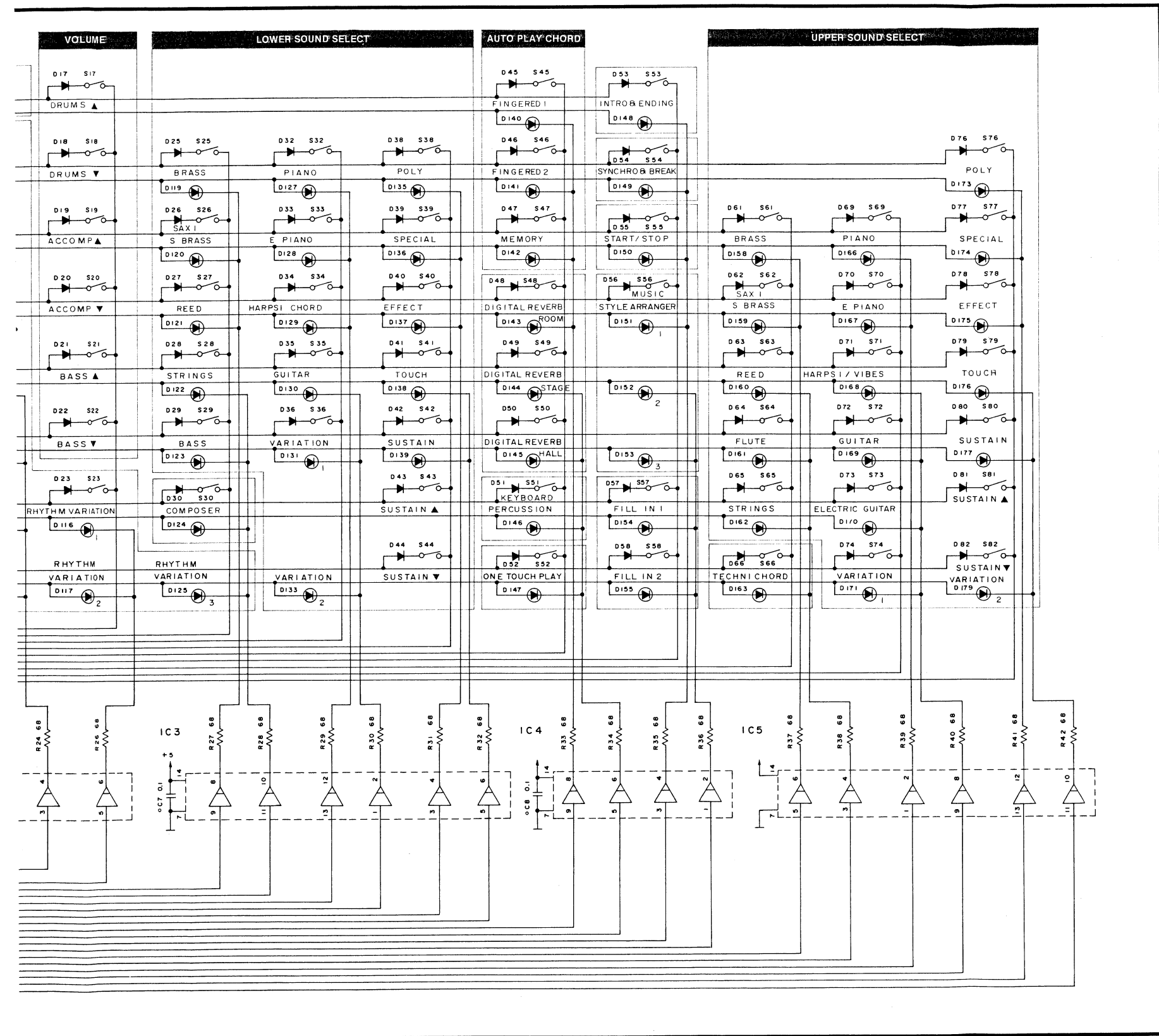


CPSL

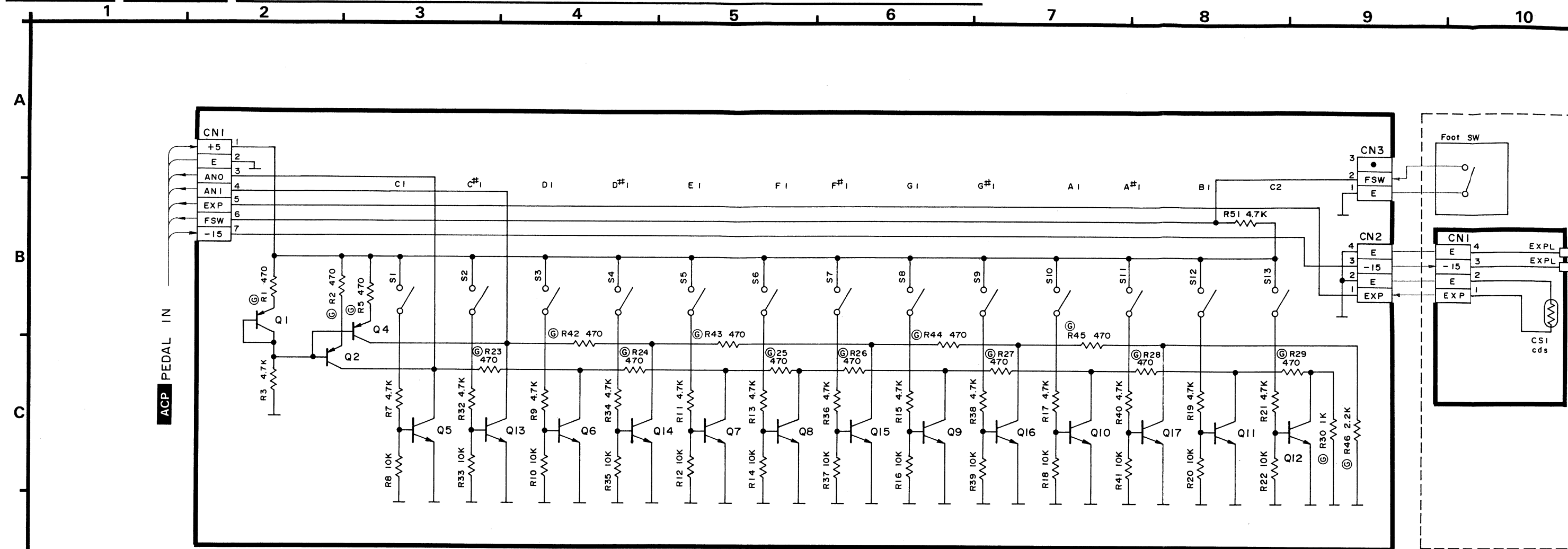


LEFT AND FD CONNECTOR CIRCUIT DIAGRAM

5 6 7 8 9 10 11 12 13 14



- CPSL NOTES:**
- IC'S
 - IC1: SVIGM603A121
 - IC2, 4: HD74LS07P
 - IC3, 5: M74LS07FP
 - TRANSISTORS
 - Q1~4: 2SA830SB
 - DIODES
 - D3~9, 11~23, 25~30, 32~36, 38~59, 61~66, 69~74, 76~82: MA165TA5
 - D103~108, 110~117, 119~123, 125, 127~131, 133, 135~146, 148~155, 158~163, 166~177, 179: LN282R
 - D124, 147: LN382G



PKB

NOTES:

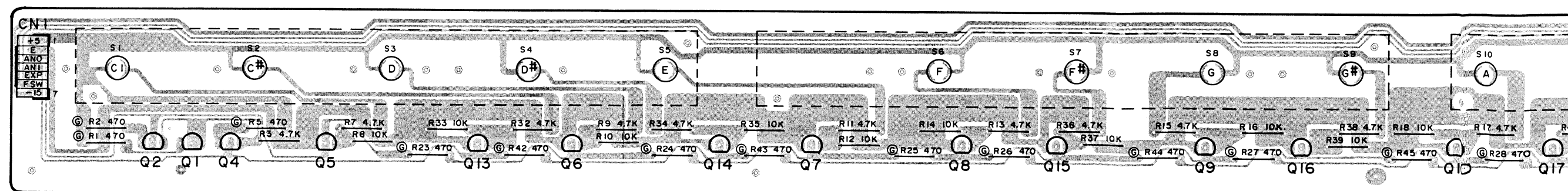
- TRANSISTORS

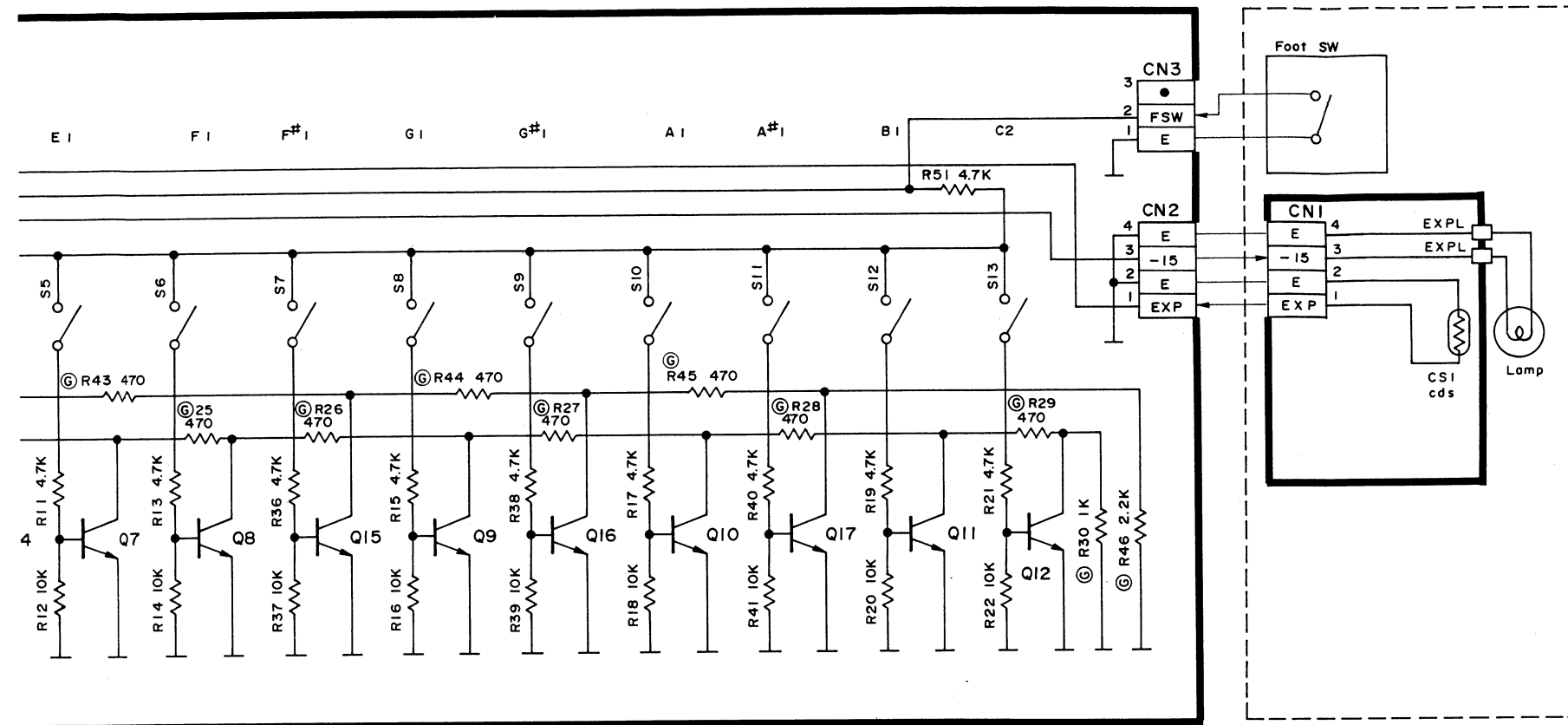
Q1, 2, 4: 29

Q5~17: 29

PKB

PEDAL KEYBOARD CIRCUIT BOARD



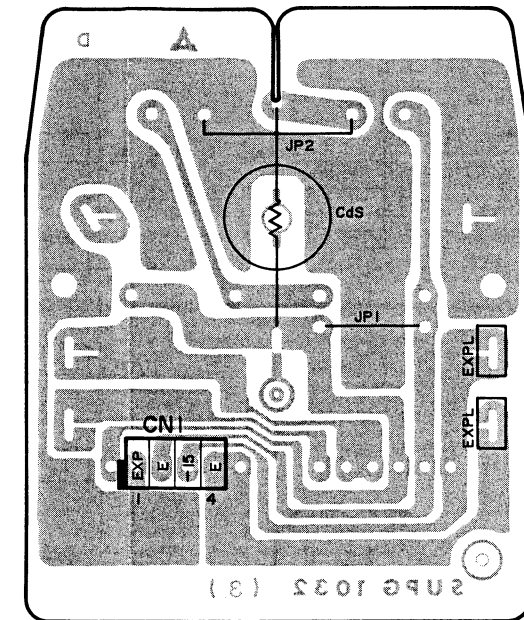


PKB

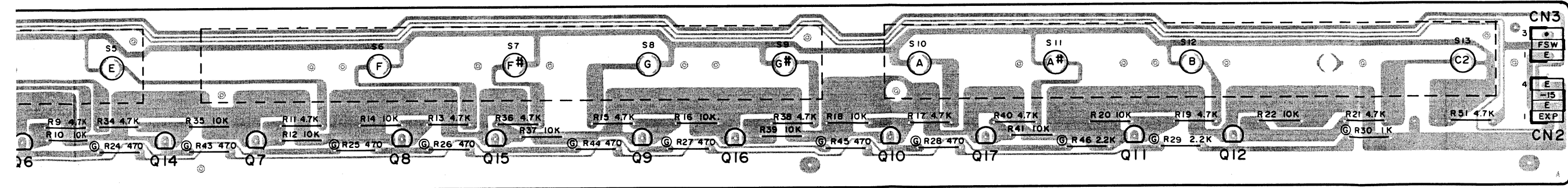
NOTES:

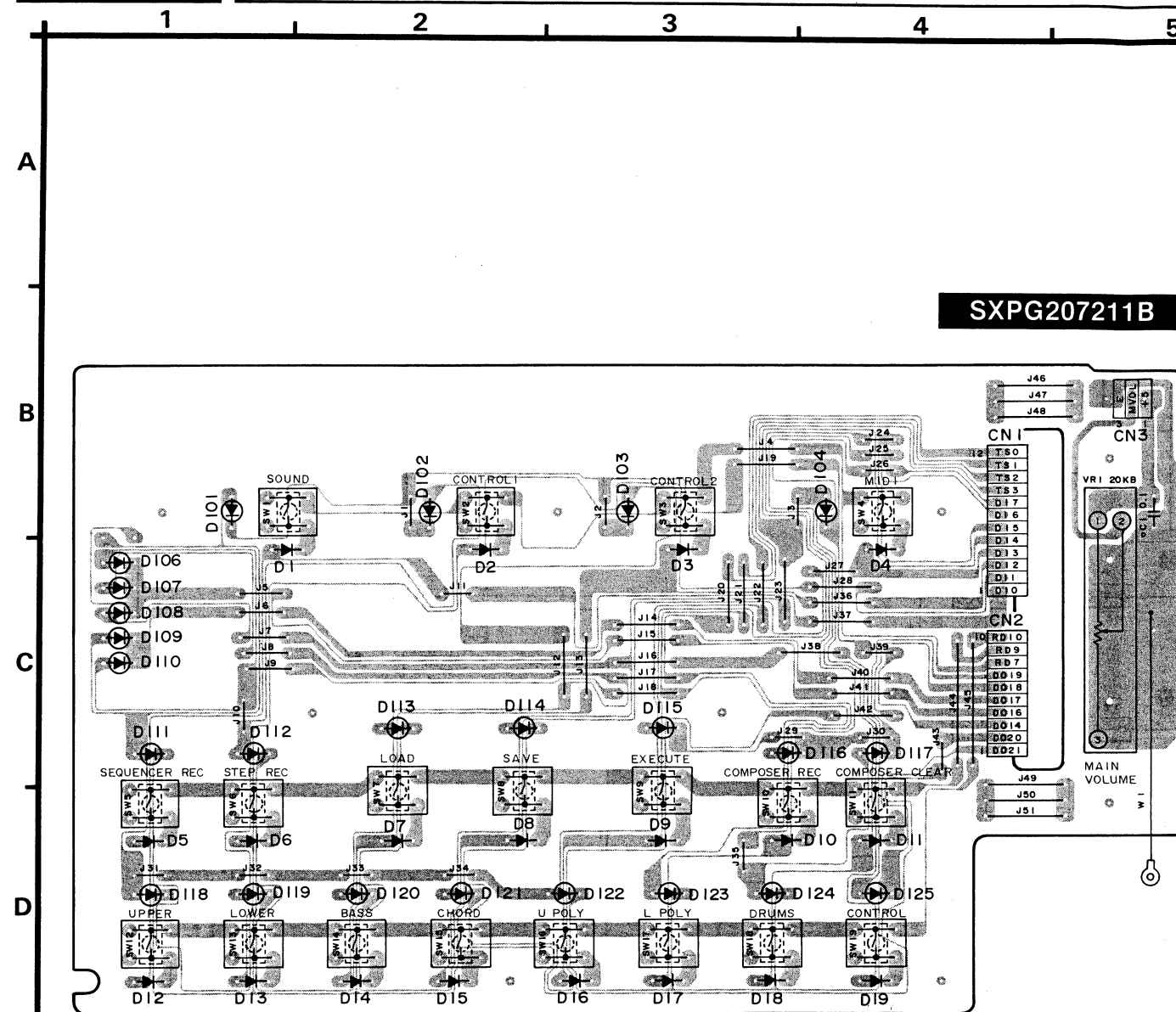
- TRANSISTORS
- Q1, 2, 4: 2SA1015-GR
- Q5~17: 2SC2320LFG

SXPG103211



SXPG145111

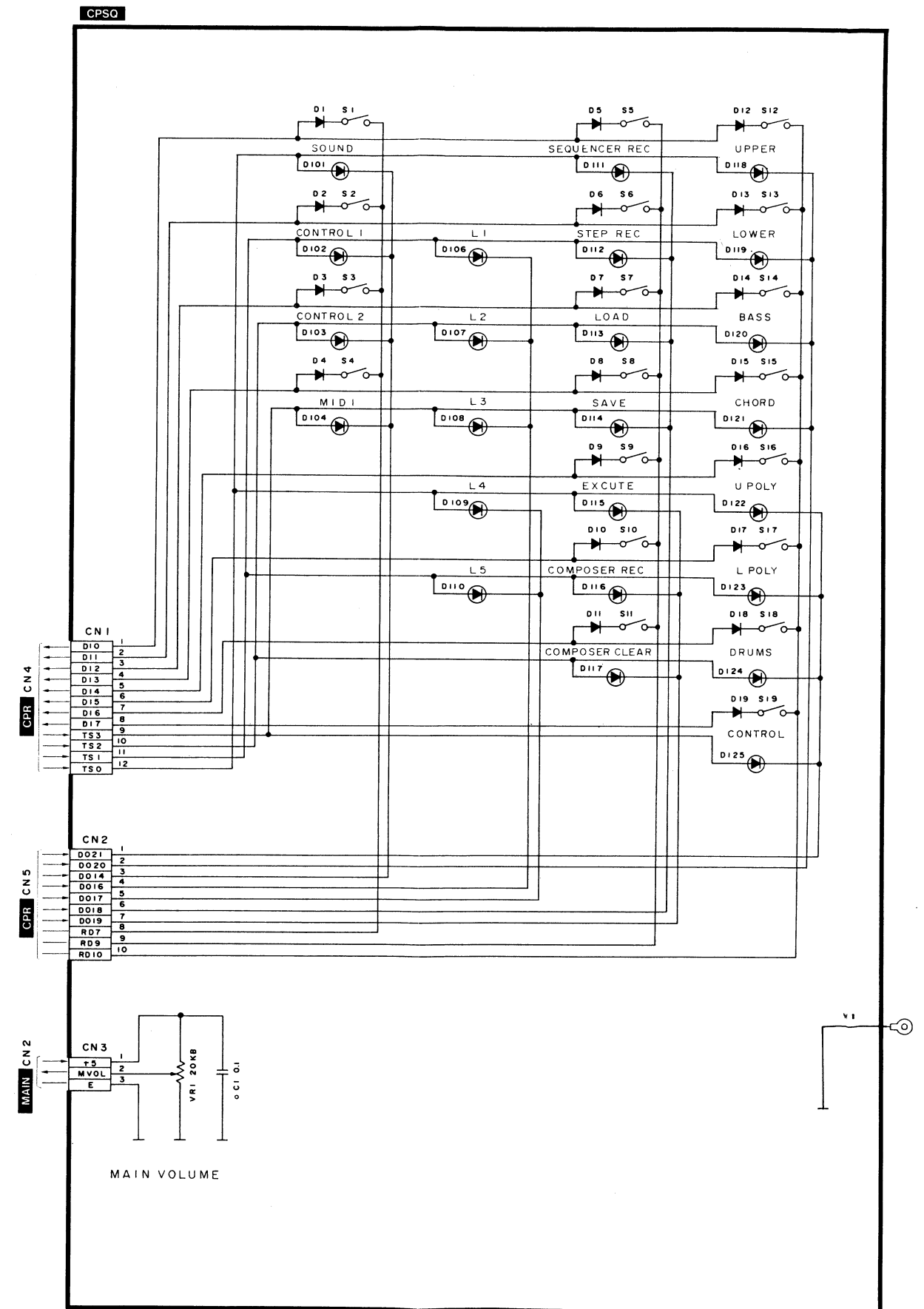


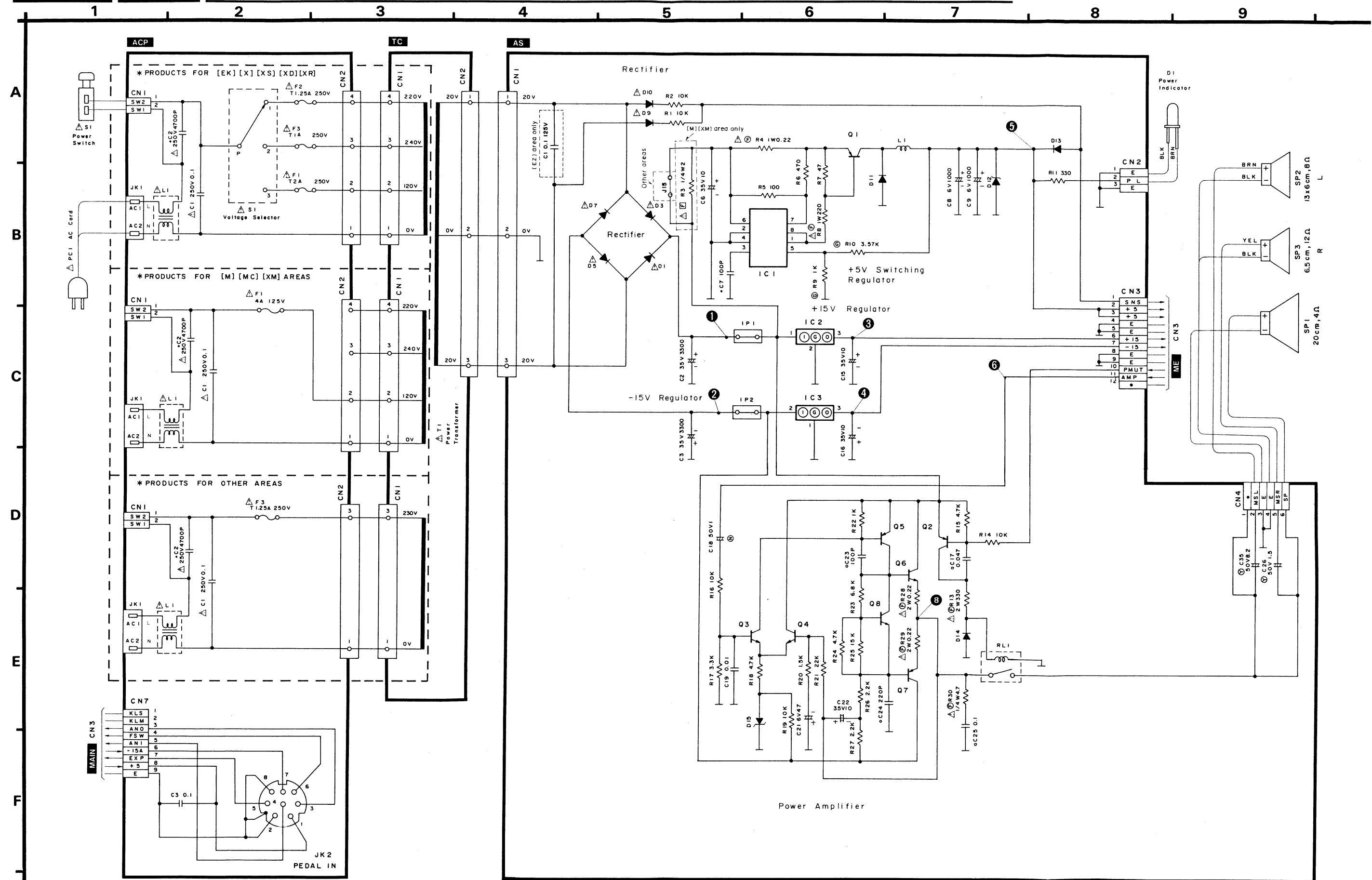


CPSQ

NOTES:

- DIODES
- D1~19: MA165TA5
- D101~104, LN282R
- 106~110:
- D111~125: LN382G





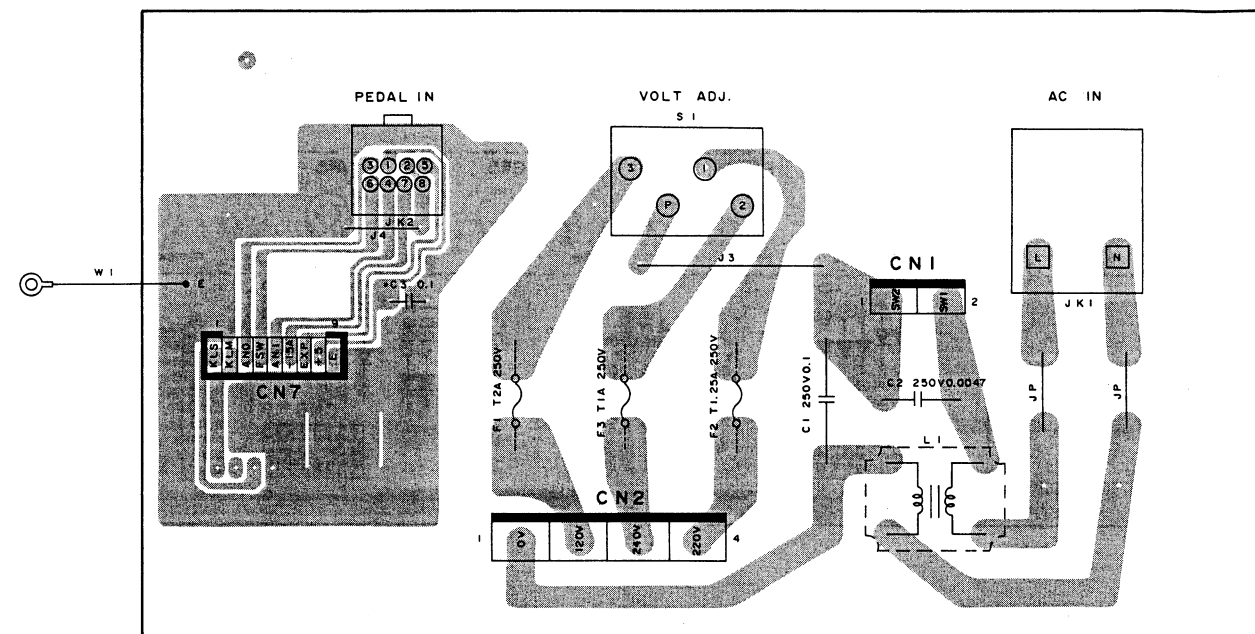
ACP

- [EK] [X] [XS] [XD] areas

SXPG209541C

- [XR] area

SXPG209561C



ACP

NOTES:

- FUSES

F1: XBA2C20TB0

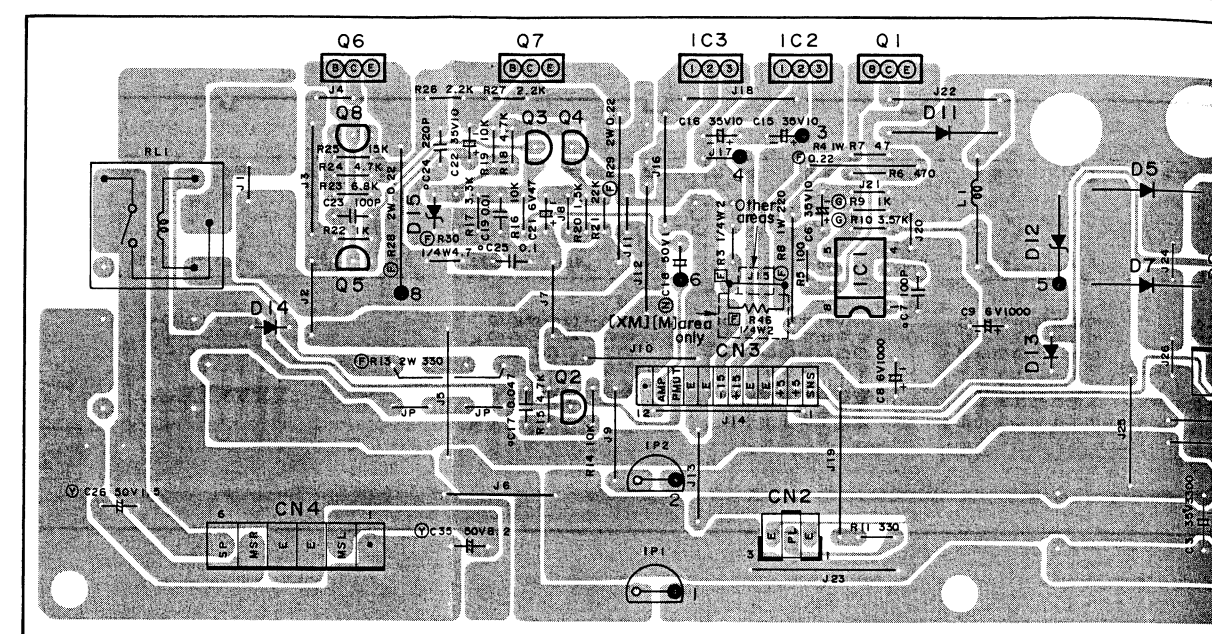
F2: XBA2C12TB0

F3: XBA2C10TB0

AS

- [EZ] area

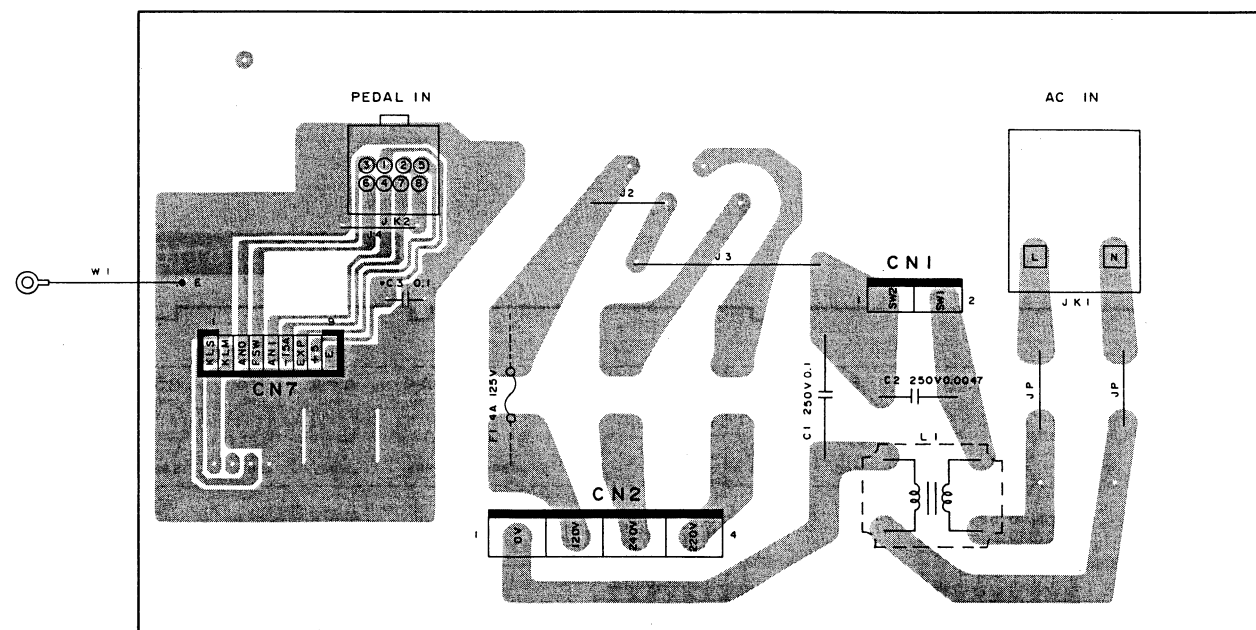
SXPG209531A



ACP

- [M] [MC] [XM] areas

SXPG209531C



ACP

NOTES:

- FUSE

F1: XBA1C40NU100

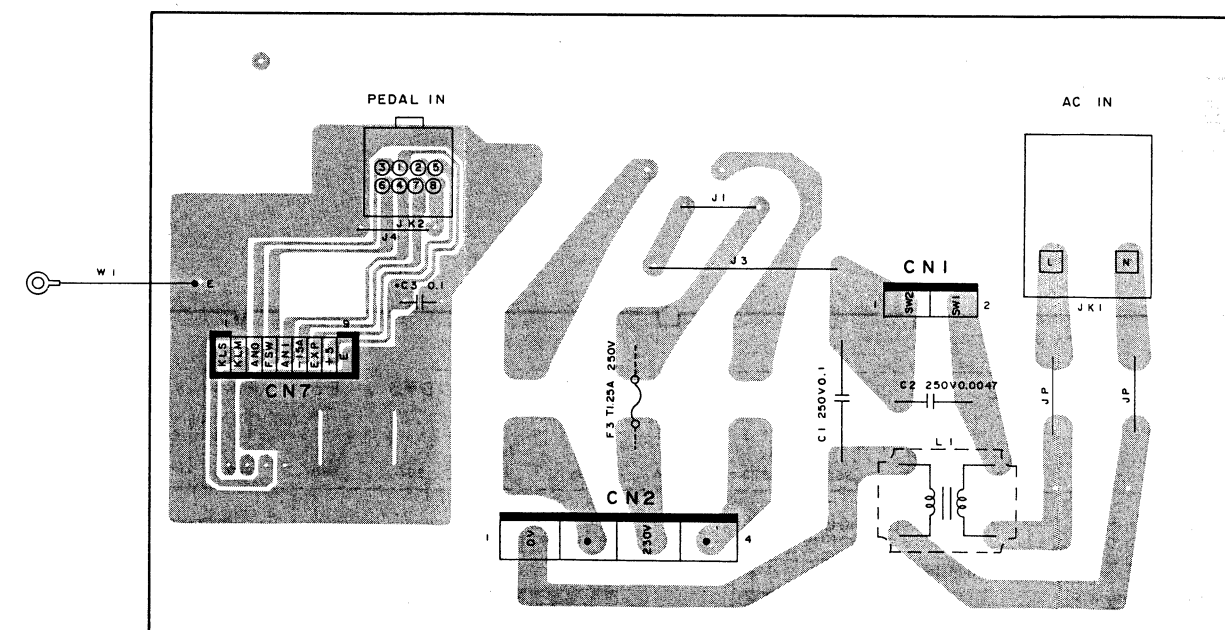
ACP

- [XL] area

SXPG209551C

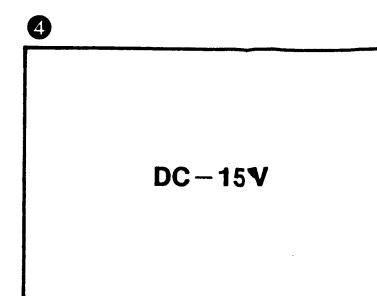
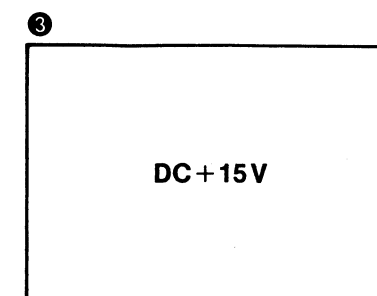
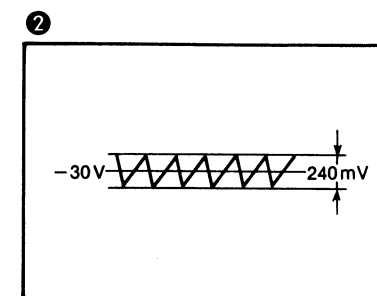
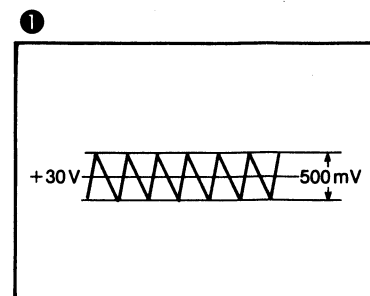
- Other areas

SXPG209511C



■ Waveform measurement

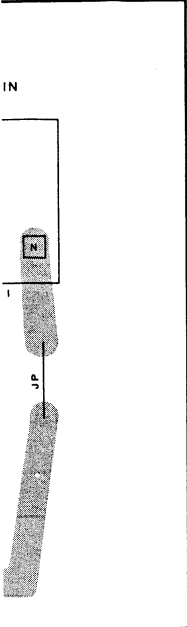
1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the E. organ to the required mode followings.
 - UPPER ORCHESTRAL CONDUCTOR.....TAB & ORGAN
 - UPPER TAB & ORGAN FLUTE 8'----- ON
FLUTE 16' 4' 2'----- OFF
TREMOLO----- OFF
 - DIGITAL REVERB.....STAGE



& POWER SUPPLY CIRCUIT BOARD

5 6 7 8 9 10 11 12 13 14

209561C



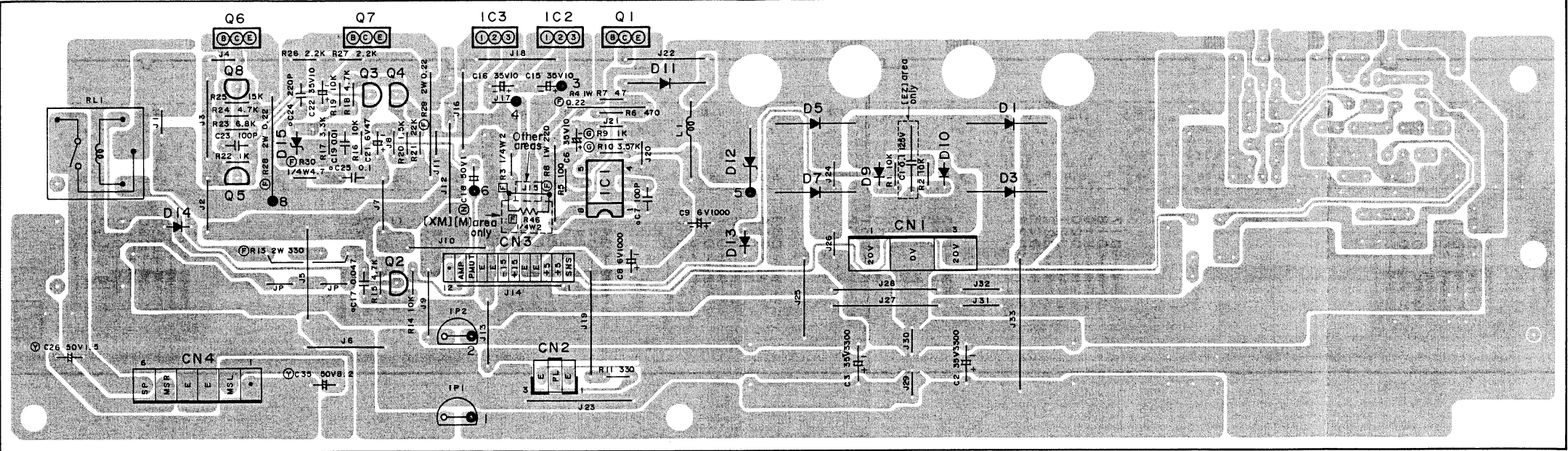
ACP

NOTES:

- FUSES
F1: XBA2C20TB0
F2: XBA2C12TB0
F3: XBA2C10TB0

AS

[EZ] area SXP209531A • [M] [XM] areas SXP209521A • Other areas SXP209511A

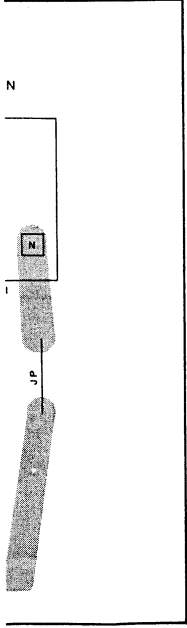


AS

NOTES:

- IC'S
IC1: SVIGM5291P
IC2: SVIGM5F7815
IC3: SVIGM5F7915
- TRANSISTORS
Q1: 2SA1643
Q2: 2SA1015-GR
Q3, 4, 8: 2SC1815GR
Q5: 2SA1123S
Q6: 2SD1277A
Q7: 2SB951A
- DIODES
D1, 3, 5, 7: SVDGS3V20-15
D9, 10: SVDGERA1502
D11: SVDGRK14S
D12: MA2062LF
D13, 14: MA165TA5
D15: MA4062

G209531C



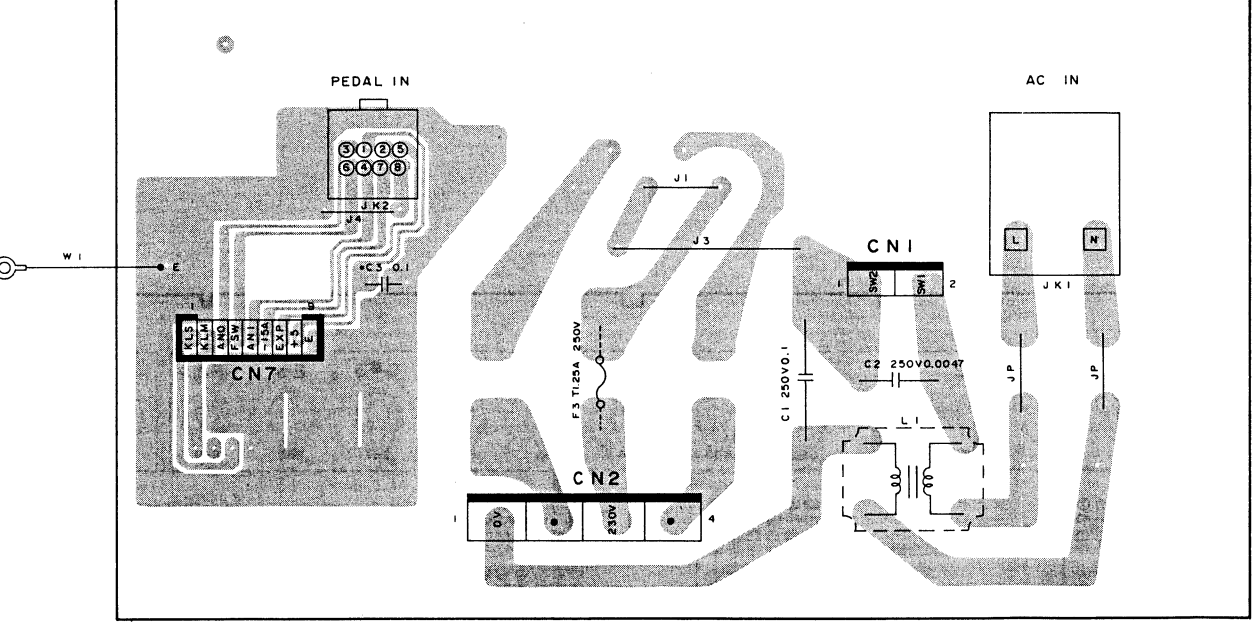
ACP

NOTES:

- FUSE
F1: XBA1C40NU100

ACP

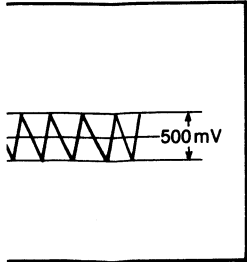
[XL] area SXP209551C • Other areas SXP209511C



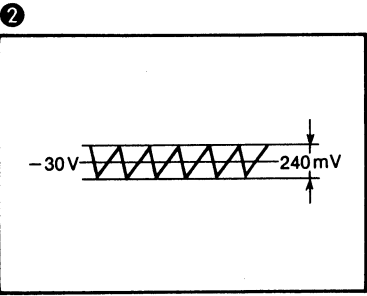
ACP

NOTES:

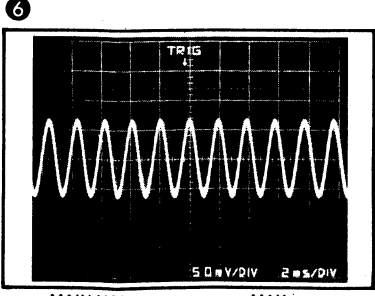
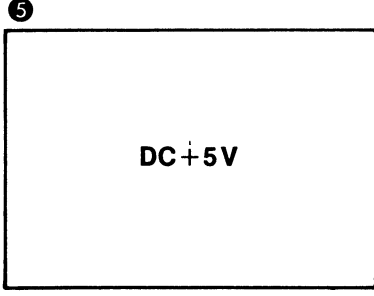
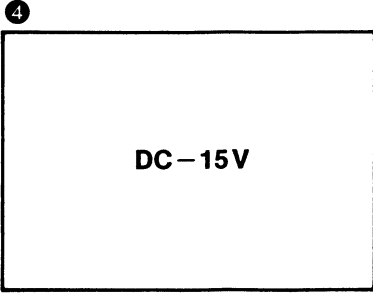
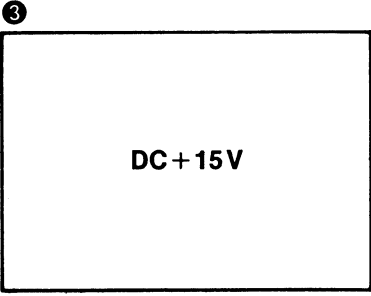
- FUSE
F3: XBA2C12TB0



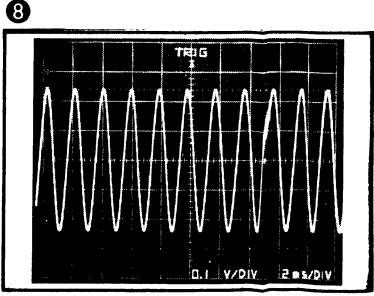
II-33



II-34



- MAIN VOL MAX
- EXP. PEDAL MAX
- Upper Keyboard.....C4 Key

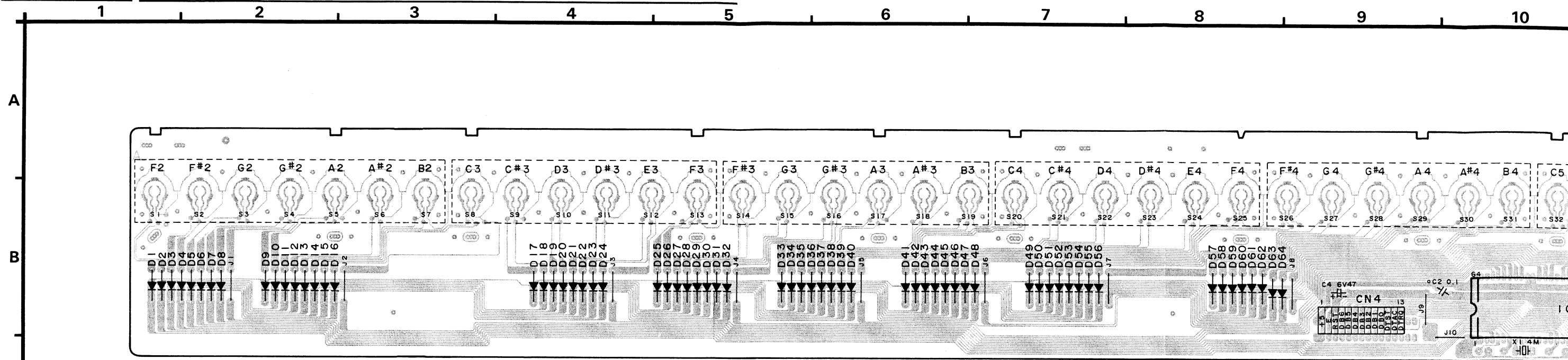


- MAIN VOL MAX
- EXP. PEDAL MAX
- Upper Keyboard.....C4 Key

II-35

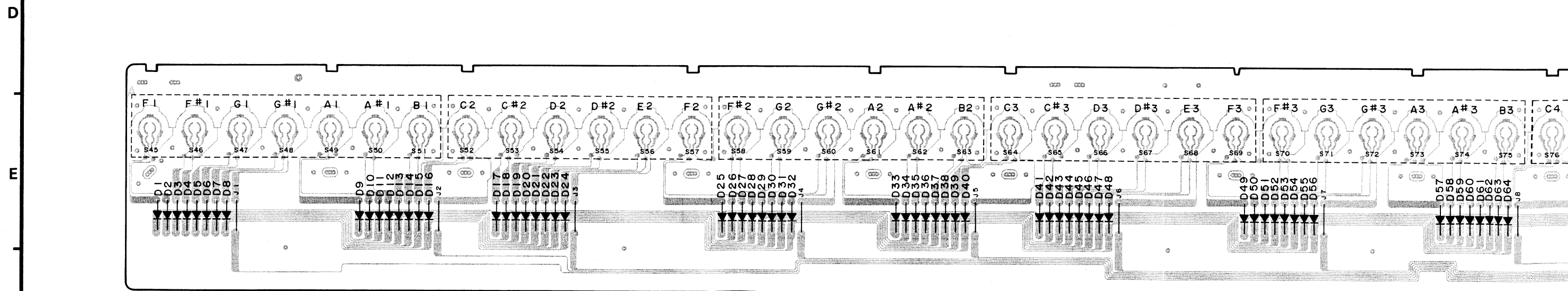
MKBU

UPPER MANUAL KEYBOARD CIRCUIT BOARD

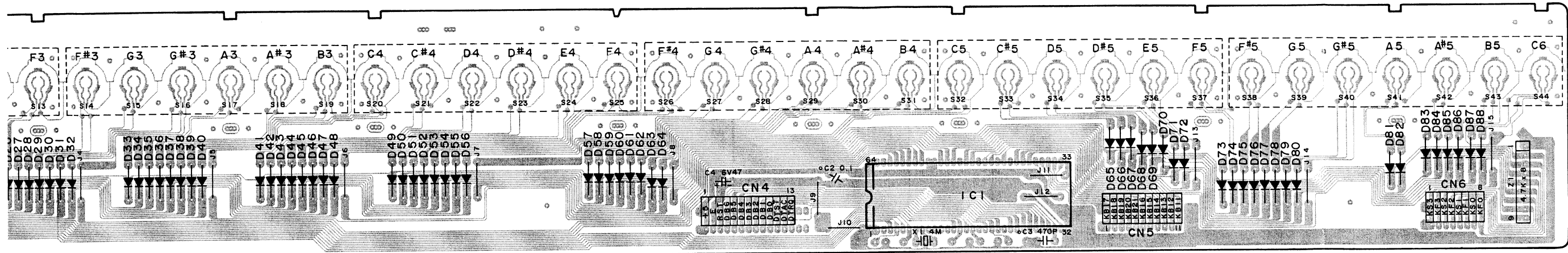


MKBL

LOWER MANUAL KEYBOARD CIRCUIT BOARD



SXPG207611A



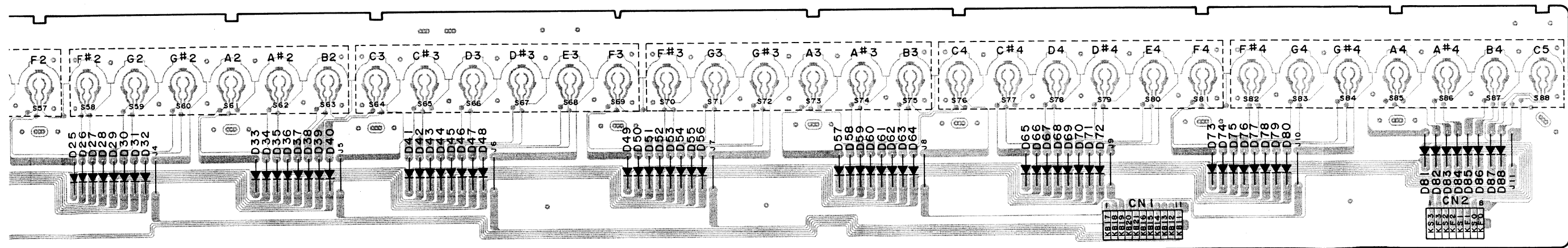
MKBU

NOTES:

- IC'S
IC1: MN50020PGV
- DIODES
D1~88: MA162A

BOARD

SXPG207611B



MKBL

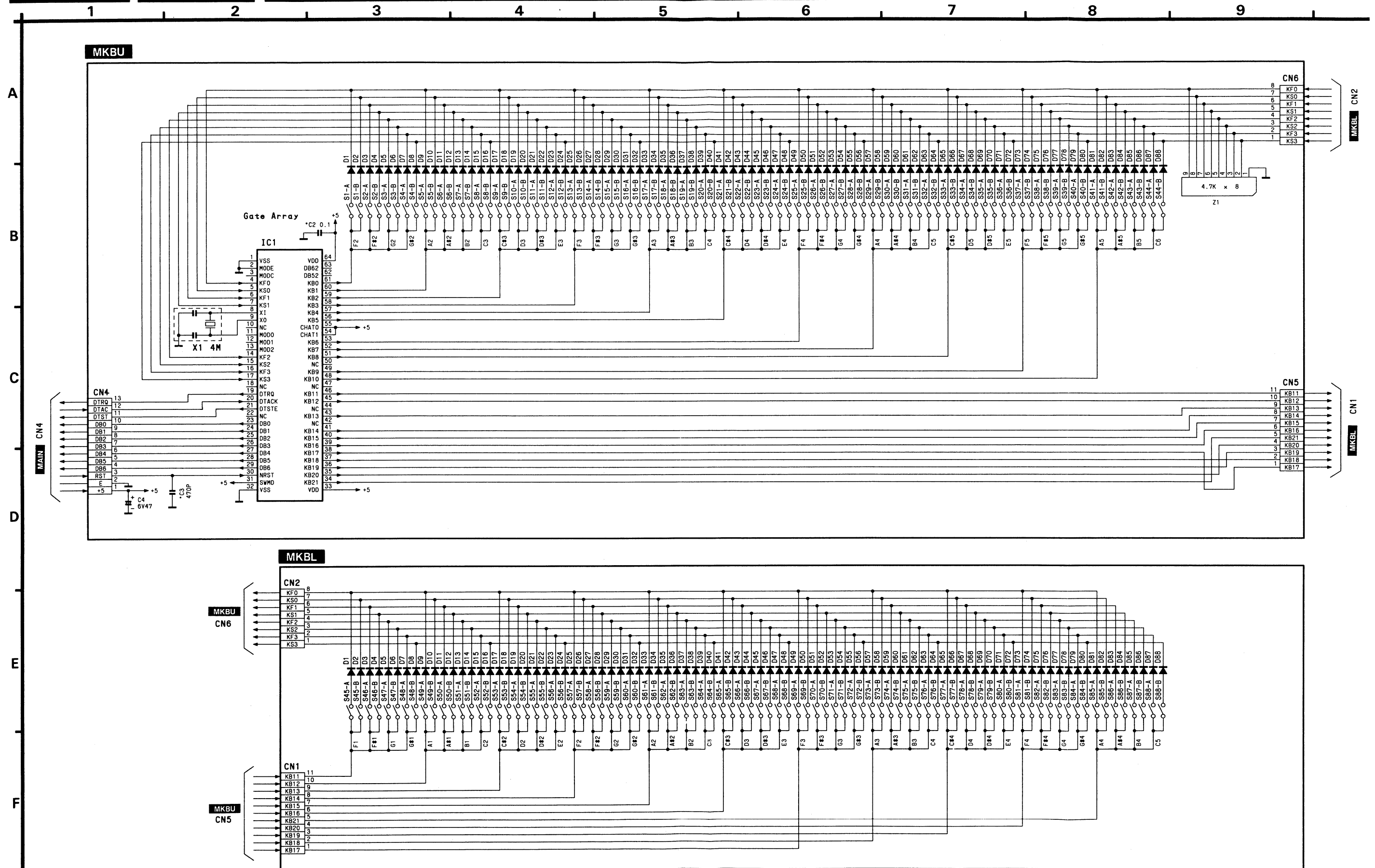
NOTES:

- DIODES
D89~176: MA162A

MKBU

MKBL

UPPER AND LOWER MANUAL KEYBOARD CIRCUIT DIAGRAM



REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. Printed circuit boards assembly with mark (NLA is no longer available after production discontinuation of the complete set.

2. Important safety notice
Components identified by  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.

4.  mark are new parts.

5. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	NLA	Area	Part No.	Description	Per/Set
	NLA		SXPG2073131		1
	NLA	Others	SXPG2073111		1
	NLA		SXPG207521A		1
	NLA		SXPG207521B		1
	NLA		SXPG207421A		1
	NLA		SXPG207421B		1
	NLA		SXPG207221A		1
	NLA		SXPG208811B		1
	NLA		SXPG145111		1
	NLA		SXPG103211		1
	NLA		SXPG207211B		1
	NLA		SXPG209531C		1
	NLA		SXPG209541C		1
	NLA				
	NLA		SXPG209551C		1
	NLA		SXPG209561C		1
	NLA	Others	SXPG209511C		1
	NLA		SXPG209521A		1
	NLA		SXPG209531A		1
	NLA	Others	SXPG209511A		1
	NLA		SXPG207611A		1
	NLA		SXPG207611B		1

MAIN MAIN CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS				
	IC1	M74HC244FP	3-State Buffers	1
	IC2	T74H4051AF	8-channel Multiplexer	1
	IC3	M5238FP	Operational Amplifier	1
	IC4	SVIGD70320GJ	16 bit Microcomputer	1
	IC5	D65012GF-A79	Gate Array	1
	IC6	QSIGCEN4AX0	4M bit Programmed EP ROM	1
	IC7	QSIGH3C02Z10	2M bit Programmed Mask ROM	1
	IC8	HM65256BLF10	256K bit Pseudo Static RAM	1
	IC9, 10	M5256BFP12LL	256K bit static RAM	2
	IC11, 12	M74HC00FP	Quad 2-input NAND Gates	2
	IC13	MN73012PGC	Tone Generator LSI 1	1
	IC14	MN73013PGD	Tone Generator LSI 2	1
	IC16	QSIGH3C08D92	8M bit Wave ROM	1
	IC17	PCM55HP	D-A Converter	1
	IC18	M5238FP	Operational Amplifier	1
	IC19	T74H4051AF	8-channel Multiplexer	1
	IC20	M5220FP	Operational Amplifier	1
	IC21	M5218AFP	Operational Amplifier	1
	IC22	MN8305S	A-D/D-A Converter	1
	IC23	SVIG87064073	Digital Signal Processor	1
	IC24	HM65256BLF10	256K bit Pseudo Static RAM	1
	IC25	SVIGMB622416	Gate Array	1
	IC26	MN1280R	Reset IC	1
	IC27	SVIGM5278L05	+5V Voltage Regulator	1
	IC28	M74HC02FP	Quad 2-Input NOR Gates	1

	Ref. No.	Part No.	Description	Per/Set
TRANSISTORS				
	Q1	2SJ105GR	FET	1
	Q2	2SC1815GR	Transistor	1
	Q3	2SA1015-GR	2SA933STRS (SUB. Part)	1
DIODES				
	D1~4, 7, 8, 12, 13, 101	MA165TA5	Diode	9
	D6	MA4051MTA	Zener, 5.1V	1
	D9, 10	MA4056H	Zener, 5.8V	2
	D11	EK04	Diode	1
OSCILLATORS				
	X1	QSXG1A1400A	14MHz, Quartz Oscillator	1
	X2	QSXG1B4000B	40MHz, Quartz Oscillator	1
	X3	SVQGA20MX040	20MHz, Ceramic Oscillator	1
COMPONENT COMBINATIONS				
	Z1, 2, 4	EXBPI8472JM	4.7kΩ × 8	3
	Z3	EXAMR14A1002	1kΩ/2kΩ, Ladder Network	1
COILS				
	L1, 101~105	QLQGT1B600MA	Coil	6
	L15, 22	QLQGT3T150SA	Coil	2
SEMI-FIXED RESISTORS				
	VR1, 2	EVND4AA00B14	10kΩ B, Offset Adj, DRV Bias Adj.	2
RESISTORS				
	R1	ERDS2TJ184	180kΩ	1
	R2	ERDS2TJ472	4.7kΩ	1
	R3~6	ERDS2TJ102	1kΩ	4
	R7, 8	ERDS2TJ472	4.7kΩ	2
	R9, 10	ERDS2TJ473	47kΩ	2
	R11	ERDS2TJ103	10kΩ	1
	R12	ERDS2TJ102	1kΩ	1
	R13	ERDS2TJ103	10kΩ	1
	R16	ERDS2TJ472	4.7kΩ	1
	R17	ERDS2TJ154	150kΩ	1
	R19, 20	ERDS2TJ102	1kΩ	2
	R21	ERDS2TJ104	100kΩ	1
	R22	ERDS2TJ103	10kΩ	1
	R23	ERDS2TJ473	47kΩ	1
	R24	ERDS2TJ472	4.7kΩ	1
	R25~30	ERDS2TJ103	10kΩ	6
	R31	ERDS2TJ472	4.7kΩ	1
	R32	ERDS2TJ473	47kΩ	1
	R33	ERDS2TJ332	3.3kΩ	1
	R34	ERDS2TJ183	18kΩ	1
	R39	ERDS2TJ102	1kΩ	1

	Ref. No.	Part No.	Description	Per/Set
	R40	ERDS2TJ154	150kΩ	1
	R55	ERDS2TJ681	680Ω	1
	R56, 57	ERDS2TJ472	4.7kΩ	2
	R58	ERDS2TJ155	1.5MΩ	1
	R59	ERDS2TJ334	330kΩ	1
	R60	ERDS2TJ225	2.2MΩ	1
	R61	ERDS2TJ101	100Ω	1
	R62	ERDS2TJ332	3.3kΩ	1
	R63	ERDS2TJ562	5.6kΩ	1
	R64	ERDS2TJ105	1MΩ	1
	R65	ERDS2TJ472	4.7kΩ	1
	R66~69	ERDS2TJ681	680Ω	4
	R71	 ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	1
	R72	ERDS2TJ152	1.5kΩ	1
	R73	ERDS2TJ563	56kΩ	1
	R74	ERDS2TJ823	82kΩ	1
	R75, 76	ERDS2TJ103	10kΩ	2
	R77	ERDS2TJ473	47kΩ	1
	R78	ERDS2TJ682	6.8kΩ	1
	R79	ERDS2TJ332	3.3kΩ	1
	R80	ERDS2TJ183	18kΩ	1
	R81	ERDS2TJ103	10kΩ	1
	R82	ERDS2TJ472	4.7kΩ	1
	R83	ERDS2TJ153	15kΩ	1
	R84	ERDS2TJ103	10kΩ	1
	R85	ERDS2TJ472	4.7kΩ	1
	R86	ERDS2TJ153	15kΩ	1
	R89	ERDS2TJ105	1MΩ	1
	R90~94	ERDS2TJ152	1.5kΩ	5
	R95, 96	ERDS2TJ471	470Ω	2
	R97, 98	 ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	2
	R99~101	 ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	3
	R106	ERDS2TJ103	10kΩ	1
	R107~110	ERDS2TJ472	4.7kΩ	4
	R111, 112	ERDS2TJ103	10kΩ	2
	R113	ERDS2TJ823	82kΩ	1
	R114	ERDS2TJ101	100Ω	1
	R201~203	ERDS2TJ103	10kΩ	3
	R210	ERDS2TJ154	150kΩ	1
	R211~253	ERDS2TJ221	220Ω	43
	R254	ERDS2TJ102	1kΩ	1
CAPACITORS				
	C1	ECRR1H104ZF	0.1μF	1
	C2	ECKR1E473ZV	0.047μF	1
	C3~5	ECRR1H104ZF	0.1μF	3
	C7, 8	ECRR1H104ZF	0.1μF	2
	C12	ECCR1H221J	220pF	1
	C13	ECCR1H101J	100pF	1
	C14, 15	ECCR1H030C	3pF	2
	C16	ECEA0JKA331	330μF, 6.3V	1
	C17	ECRR1H104ZF	0.1μF	1
	C19	ECEA1HKA010	1μF, 50V	1
	C20	ECKR1E473ZV	0.047μF	1
	C22	ECEA0JKA331	330μF, 6.3V	1
	C23	ECEA0JKA470	47μF, 6.3V	1
	C24	ECQV1H474JZ	0.47μF	1
	C25~27	ECRR1H104ZF	0.1μF	3
	C28, 29	ECKR1E473ZV	0.047μF	2
	C31	ECRR1H104ZF	0.1μF	1
	C32, 33	ECEA0JKA470	47μF, 6.3V	2
	C34	ECCR1H471J	470pF	1
	C36	ECCR1H220J	22pF	1
	C37	ECRR1H104ZF	0.1μF	1
	C38	ECKR1E473ZV	0.047μF	1
	C39, 40	ECRR1H104ZF	0.1μF	2
	C41	ECEA1CKN100	10μF, 16V	1

Ref. No.	Part No.	Description	Per/Set
C42	ECEA1CKA470	47μF, 16V	1
C44, 45	ECEA0JKA331	330μF, 6.3V	2
C46, 47	ECEA1HKA010	1μF, 50V	2
C48	ECQG1H152KZ	0.0015μF	1
C49	ECCR1H151J	150pF	1
C50	ECEA1HKA010	1μF, 50V	1
C51	ECQG1H152KZ	0.0015μF	1
C52	ECEA1HKA010	1μF, 50V	1
C53	ECQG1H152KZ	0.0015μF	1
C54~56	ECEA0JKA101	100μF, 6.3V	3
C57	ECKR1E473ZV	0.047μF	1
C60	ECCR1H101J	100pF	1
C61, 62	ECCR1H030C	3pF	2
C64, 65	ECCR1H470J	47pF	2
C67, 68	ECEA1CKA101	100μF, 16V	2
C69	ECRR1H104ZF	0.1μF	1
C70	ECEA0JKA221	220μF, 6.3V	1
C71	EECF5R5U105	1F, 5.5V, Memory Back-up	1
C72	ECRR1H104ZF	0.1μF	1
C73	ECQG1H102KZ	0.001μF	1
C100~102	ECRR1H104ZF	0.1μF	3
C103	ECEA0JKA331	330μF, 6.3V	1
C110~112	ECRR1H104ZF	0.1μF	3

Ref. No.	Part No.	Description	Per/Set	Ref. No.	Part No.	Description	Per/Set
R67	ERDS2TJ472	4.7kΩ	1	C28	ECQM1H103KV	0.01μF	1
R68	ERDS2TJ222	2.2kΩ	1	C29	ECKR1E473ZV	0.047μF	1
R69	ERDS2TJ472	4.7kΩ	1	C32~39	ECQG1H222KZ	0.0022μF	8
R70~72	ERDS2TJ333	33kΩ	3	C40	ECQG1H152KZ	0.0015μF	1
R73	ERDS2TJ472	4.7kΩ	1	C41	ECCR1H680J	68pF	1
R74	ERDS2TJ222	2.2kΩ	1	C42	ECQG1H152KZ	0.0015μF	1
R75	ERDS2TJ472	4.7kΩ	1	C43	ECCR1H680J	68pF	1
R76~78	ERDS2TJ333	33kΩ	3	C44	ECRR1H104ZF	0.1μF	1
R80	ERDS2TJ331	330Ω	1	C45, 46	ECQG1H152KZ	0.0015μF	2
R83, 84	ERDS2TJ472	4.7kΩ	2	C47	ECCR1H681J	680pF	1
R85	ERDS2TJ331	330Ω	1	C48	ECQG1H332KZ	0.033μF	1
R86	ERDS2TJ681	680Ω	1	C49	ECCR1H681J	680pF	1
R89	ERDS2TJ682	6.8kΩ	1	C50	ECCR1H101J	100pF	1
R90	ERDS2TJ152	1.5kΩ	1	C51	ECCR1H680J	68pF	1
R91	ERDS2TJ103	10kΩ	1	C52	ECQG1H332KZ	0.0033μF	1
R93	ERDS2TJ103	10kΩ	1	C53	ECEA1HKA010	1μF, 50V	1
R97	ERDS2TJ333	33kΩ	1	C54	ECQG1H102KZ	0.001μF	1
R98	ERDS2TJ224	220kΩ	1	C55	ECRR1H104ZF	0.1μF	1
R100	ERDS2TJ222	2.2kΩ	1	C56	ECEA1HKA010	1μF, 50V	1
R103	ERDS2TJ220	22Ω	1	C57, 58	ECEA1CU470	47μF, 16V	2
R104	ERDS2TJ224	220kΩ	1	C59	ECQB1H103JZ	0.01μF	1
R106	ERDS2TJ224	220kΩ	1	C60	ECKR1E473ZV	0.047μF	1
R107	ERDS2TJ224	220kΩ	1	C61	ECQB1H103JZ	0.01μF	1
R108	ERDS2TJ220	22Ω	1	C62	ECEA1CU470	47μF, 16V	1
R109	ERDS2TJ224	220kΩ	1	C63	ECEA1HKA010	1μF, 50V	1
R111	ERDS2TJ224	220kΩ	1	C64	ECQG1H472KZ	0.0047μF	1
R116	ERDS2TJ473	47kΩ	1	C65	ECRR1H104ZF	0.1μF	1
R117	ERDS2TJ154	150kΩ	1	C66, 67	ECEA1HKN010	1μF, 50V	2
R119	ERDS2TJ103	10kΩ	1	C80, 81	ECCR1H220J	22pF	2
R120	ERDS2TJ223	22kΩ	1	C84	ECQG1H472KZ	0.0047μF	1
R121	ERDS2TJ104	100kΩ	1	C86	ECQV1H474JZ	0.47μF	1
R124~131	ERDS2TJ334	330kΩ	8	C87	ECKR1E473ZV	0.047μF	1
R132	ERDS2TJ684	680kΩ	1	C90	ECCR1H470J	47pF	1
R133	ERDS2TJ103	10kΩ	1	C91	ECQM1H223KV	0.022μF	1
R143~145	ERDS2TJ473	47kΩ	3	C92	ECCR1H471J	470pF	1
R146	ERDS2TJ104	100kΩ	1	C93, 94	ECCR1H101J	100pF	2
R147	ERDS2TJ103	10kΩ	1	C96, 97	ECQG1H102KZ	0.001μF	2
R148	ERDS2TJ333	33kΩ	1	C98, 99	ECCR1H471J	470pF	2
R149	ERDS2TJ103	10kΩ	1	C130	ECQG1H222KZ	0.0022μF	1
R150	ERDS2TJ333	33kΩ	1	C132	ECQG1H472KZ	0.0047μF	1
R151	ERDS2TJ103	10kΩ	1	C133	ECQM1H223KV	0.022μF	1
R154	ERDS2TJ683	68kΩ	1	C134	ECQG1H102KZ	0.001μF	1
R157	ERDS2TJ154	150kΩ	1	C135	ECQB1H103JZ	0.01μF	1
R159	ERDS2TJ104	100kΩ	1	C143	ECEA1CU470	47μF, 16V	1
R211	ERDS2TJ104	100kΩ	1	C145	ECEA1CU470	47μF, 16V	1
R212	ERDS2TJ223	22kΩ	1	C147	ECQG1H682KZ	0.0068μF	1
R213, 214	ERDS2TJ473	47kΩ	2	C148	ECQV1H473JZ	0.047μF	1
R215	ERDS2TJ153	15kΩ	1	C150	ECKR1E473ZV	0.047μF	1
R216	ERDS2TJ333	33kΩ	1	C159	ECKR1E473ZV	0.047μF	1
R217	ERDS2TJ223	22kΩ	1	C170	ECQG1H222KZ	0.0022μF	1
R250, 251 △	ERD2FCVG100	10Ω, 1/4W, Fuse Type	2	C171	ECEA1CU331	330μF, 16V	1
R300	ERDS2TJ105	1MΩ	1	C172	ECEA1CU470	47μF, 16V	1
R301~303	ERDS2TJ103	10kΩ	3	C219	ECQG1H222KZ	0.0022μF	1
R304	ERDS2TJ225	2.2MΩ	1	C301	ECEA1HKN010	1μF, 50V	1
R305	ERDS2TJ332	3.3kΩ	1	C302	ECEA1HKA010	1μF, 50V	1
R306, 307 △	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	2	C304	ECCR1H471J	470pF	1
R311	ERDS2TJ221	220Ω	1	C305	ECCR1H221J	220pF	1
R316	ERDS2TJ102	1kΩ	1				
R317, 318	ERDS2TJ331	330Ω	2				
CAPACITORS							
C2	ECEA0JKA470	47μF, 6.3V	1				
C3	ECQG1H332KZ	0.0033μF	1				
C9	ECRR1H104ZF	0.1μF	1				
C10	ECQG1H472KZ	0.0047μF	1				
C11	ECKR1E473ZV	0.047μF	1				
C12, 13	ECCR1H471J	470pF	2				
C14	ECCR1H101J	100pF	1				

JACK JACK CIRCUIT			
Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUIT			
IC1	SVIGTLP513	Photo Coupler	1

Ref. No.	Part No.	Description	Per/Set
TRANSISTORS			
S Q1, 2	2SA1015-GR	2SA933STRS (SUB. Part)	2
DIODES			
D1~5	MA165TA5	Diode	5
COILS			
L1~3	QLQGT3T150SA	Coil	3
JACKS			
JK1, 2	SJJG100A	Jack, HEADPHONES 1, 2	2
JK3, 5	QJJG003AA	Jack, LINE OUT, AUX IN	2
JK7~9	SJSG1370A	MIDI THRU, OUT, IN	3
RESISTORS			
R1	ERDS2TJ104	100kΩ	1
R2	ERDS2TJ221	220Ω	1
R3	ERDS2TJ104	100kΩ	1
R4	ERDS2TJ221	220Ω	1
R5	ERDS2TJ103	10kΩ	1
R6	ERDS2TJ221	220Ω	1
R7	ERDS2TJ331	330Ω	1
R8~11	ERG1ANJP680S	68Ω, 1W, Flame-Proof	4
R12, 13	ERDS2TJ101	100Ω	2
CAPACITORS			
C1	ECKR1E473ZV	0.047μF	1
C2	ECEA0JKA470	47μF, 6.3V	1
C3, 4	ECCR1H221J	220pF	2
C5	ECQM1H103KV	0.01μF	1
C7	ECRR1H104ZF	0.1μF	1
C8	ECQG1H222KZ	0.0022μF	1
C10	ECQG1H222KZ	0.0022μF	1
C11, 12	ECRR1H104ZF	0.1μF	2
C13, 14	ECQG1H222KZ	0.0022μF	2
WIRES			
W1, 2	QEXGRA01009A	Wire	2

CPL UPPER CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	HD74LS07P	Hex Buffers	1
IC2	SVIGUPD7225	LCD Driver	1
DIODES			
D1~5, 7~19, 21	MA165TA5	Diode	19
D102, 103, 106~118, 120, 121	LN282R	LED (Red)	17
D104	LN382G	LED (Green)	1
LCD DISPLAY			
LCD1	SXEG101A	LCD Display	1

Ref. No.	Part No.	Description	Per/Set
SWITCHES			
S2~5, 7~19, 21, 22	SSHG1049A	Push Switch	19
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2~4	ERDS2TJ472	4.7kΩ	3
R5~10	ERDS2TJ680	68Ω	6
R11	ERDS2TJ102	1kΩ	1
R12	ERDS2TJ472	4.7kΩ	1
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
C2	ECEA0JKA470	47μF, 6.3V	1
C3	ECRR1H104ZF	0.1μF	1
C4	ECCR1H101J	100pF	1

CPR UPPER CONTROL PANEL RIGHT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2, 3	HD74LS07P	Hex Buffers	2
TRANSISTORS			
Q1~4	2SA830SB	Transistor	4
DIODES			
D1, 5~7, 9~14, 18~29	MA165TA5	Diode	22
D104~106	LN382G	LED (Green)	3
D108~113	LN282R	LED (Red)	6
SWITCHES			
S1, 5~7, 9~14, 18~29	SSHG1049A	Push Switch	22
IC PROTECTOR			
IP1	ICP-N10T104	IC Protector	1
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2	ERDS2TJ221	220Ω	1
R3~15	ERDS2TJ103	10kΩ	13
R21~24	ERDS2TJ680	68Ω	4
R26~31	ERDS2TJ680	68Ω	6
R32	ERDS2TJ222	2.2kΩ	1
CAPACITORS			
C1	ECEA0JKA470	47μF, 6.3V	1
C2	ECRR1H104ZF	0.1μF	1
C3	ECBA1H101KB5	100pF	1
C4	ECCR1H101J	100pF	1
C5, 6	ECRR1H104ZF	0.1μF	2
C7	ECBA1C682MR5	0.0068μF	1

Ref. No.	Part No.	Description	Per/Set
WIRE			
W1	SWEG300A	Wire	1

CPSL LOWER CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2, 4	HD74LS07P	Hex Buffers	2
IC3, 5	M74LS07FP	Hex Buffers	2
TRANSISTORS			
Q1~4	2SA830SB	Transistor	4
DIODES			
D3~9, 11~23, 25~30, 32~36, 38~58, 61~66, 69~74, 76~82	MA165TA5	Diode	71
D103~108, 110~117, 119~123, 125, 127~131, 133, 135~146, 148~155, 158~163, 166~177, 179	LN282R	LED (Red)	65
D124, 147	LN382G	LED (Green)	2
COMPONENT COMBINATION			
Z1	EXBPI8103JM	10kΩ × 8	1
SWITCHES			
S3~9, 11~23, 25~30, 32~36, 38~58, 61~66, 69~74, 76~82	SSHG1049A	Push Switch	71
IC PROTECTOR			
IP1	ICP-N10T104	IC Protector	1
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2	ERDS2TJ221	220Ω	1
R3	ERDS2TJ222	2.2kΩ	1
R5	ERDS2TJ102	1kΩ	1
R13~16	ERDS2TJ103	10kΩ	4
R21~24	ERDS2TJ680	68Ω	4
R26~42	ERDS2TJ680	68Ω	17

Ref. No.	Part No.	Description	Per/Set
CAPACITORS			
C1	ECEA0JKA470	47μF, 6.3V	1
C2	ECCR1H101J	100pF	1
C4	ECBA1C682MR5	0.0068μF	1
C5	ECCR1H101J	100pF	1
C6~8	ECRR1H104ZF	0.1μF	3

Ref. No.	Part No.	Description	Per/Set
WIRE			
W1	SWEG640A	Wire	1

FDCN FD CONNECTOR CIRCUIT

Ref. No.	Part No.	Description	Per/Set
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
C2	ECCR1H101J	100pF	1
SOCKET			
CN3	SJSG16SM222A	Socket	1

PKB PEDAL KEYBOARD CIRCUIT

Ref. No.	Part No.	Description	Per/Set
TRANSISTORS			
S Q1, 2, 4	2SA1015-GR	2SA933STRS (SUB. Part)	3
S Q5~17	2SC2320LFG	2SC1310FG (SUB. Part)	13
SWITCHES			
S1~13	SHGG50A	Rubber Switch (5 pcs. on one)	3
RESISTORS			
R1, 2	ER0S2CKF4700	470Ω, ±1%	2
R3	ERDS2TJ472	4.7kΩ	1
R5	ER0S2CKF4700	470Ω, ±1%	1
R7	ERDS2TJ472	4.7kΩ	1
R8	ERDS2TJ103	10kΩ	1
R9	ERDS2TJ472	4.7kΩ	1
R10	ERDS2TJ103	10kΩ	1
R11	ERDS2TJ472	4.7kΩ	1
R12	ERDS2TJ103	10kΩ	1
R13	ERDS2TJ472	4.7kΩ	1
R14	ERDS2TJ103	10kΩ	1
R15	ERDS2TJ472	4.7kΩ	1
R16	ERDS2TJ103	10kΩ	1
R17	ERDS2TJ472	4.7kΩ	1
R18	ERDS2TJ103	10kΩ	1
R19	ERDS2TJ472	4.7kΩ	1
R20	ERDS2TJ103	10kΩ	1
R21	ERDS2TJ472	4.7kΩ	1
R22	ERDS2TJ103	10kΩ	1
R23~29	ER0S2CKF4700	470Ω, ±1%	7
R30	ER0S2CKF1001	1kΩ, ±1%	1
R32	ERDS2TJ472	4.7kΩ	1
R33	ERDS2TJ103	10kΩ	1
R34	ERDS2TJ472	4.7kΩ	1

III-5

Ref. No.	Part No.	Description	Per/Set
R35	ERDS2TJ103	10kΩ	1
R36	ERDS2TJ472	4.7kΩ	1
R37	ERDS2TJ103	10kΩ	1
R38	ERDS2TJ472	4.7kΩ	1
R39	ERDS2TJ103	10kΩ	1
R40	ERDS2TJ472	4.7kΩ	1
R41	ERDS2TJ103	10kΩ	1
R42~45	ER0S2CKF4700	470Ω, ±1%	4
R46	ER0S2CKF2201	2.2kΩ, ±1%	1
R51	ERDS2TJ472	4.7kΩ	1

EXP EXPRESSION CIRCUIT

Ref. No.	Part No.	Description	Per/Set
CDS			
CS1	SVEG5	Light Sensitive Device	1

CPSQ SEQUENCER CONTROL CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
D1~19	MA165TA5	Diode	19
D101~104, 106~110	LN282R	LED (Red)	9
D111~125	LN382G	LED (Green)	15
SWITCHES			
S1~19	SSHG1049A	Push Switch	19
VARIABLE RESISTORS			
VR1	EVD06510B24G	20kΩ B, MAIN VOLUME	1
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
WIRE			
W1	SWEG630A	Wire	1

ACP AC POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
LINE FILTER			
L1	SLTGLF3	Line Filter	1
JACKS			
JK1	SJVD0203B	AC Inlet	1
JK2	QJSG002AA	Pedal In	1

III-6

Ref. No.	Part No.	Description	Per/Set
SWITCH			
S1	SSRG100A	Voltage Selector	1

Ref. No.	Part No.	Description	Per/Set
FUSES			
F1	XBA1C40NU100	4A, 125V	1
F1	XBA2C20TB0	T2A, 250V	1
F2	XBA2C12TB0	T1.25A, 250V	1
F3	XBA2C10TB0	T1A, 250V	1
F3 Others	XBA2C12TB0	T1.25A, 250V	1

Ref. No.	Part No.	Description	Per/Set
CAPACITORS			
C1	ECQU2A104MN	0.1μF, 250V, Across-the-Line Capacitor	1
C2	ECKCVA1472MF	4700pF, Line-Capacitor	1
C3	ECRR1H104ZF	0.1μF	1

Ref. No.	Part No.	Description	Per/Set
WIRE			
W1	SWEG660A	Wire	1

Ref. No.	Part No.	Description	Per/Set
AC INLET COVER			
Others	SJS9334A	AC Inlet Cover	1
Others	SJS9231A	AC Inlet Cover	1

AS AMP & POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM5291P	Switching Regulator	1
IC2	SVIGM5F7815	+15V Voltage Regulator	1
IC3	SVIGM5F7915	-15V Voltage Regulator	1
TRANSISTORS			
Q1	2SA1643	Transistor	1
Q2	2SA1015-GR	2SA933STRS (SUB. Part)	1
Q3, 4, 8	2SC1815GR	Transistor	3
Q5	2SA1123S	Transistor	1
Q6	2SD1277A	Transistor	1
Q7	2SB951A	Transistor	1
DIODES			
D1, 3, 5, 7	SVDGS3V20-15	Rectifier	4
D9, 10	SVDGERA1502	Diode	2
D11	SVDGRK14S	Diode	1
D12	MA2062LF	Zener, 6.2V	1
D13, 14	MA165TA5	Diode	2
D15	MA4062	Zener, 6.2V	1
COIL			
L1	QLCGTJR10KA	Coil	1
RELAY			
RL1	SSYGMR30112	Relay	1
IC PROTECTORS			
IP1, 2	ICP-N50T104	IC Protector	2

r/Set
1
1
1
1
1
3
1

Ref. No.	Part No.	Description	Per/Set
R35	ERDS2TJ103	10kΩ	1
R36	ERDS2TJ472	4.7kΩ	1
R37	ERDS2TJ103	10kΩ	1
R38	ERDS2TJ472	4.7kΩ	1
R39	ERDS2TJ103	10kΩ	1
R40	ERDS2TJ472	4.7kΩ	1
R41	ERDS2TJ103	10kΩ	1
R42~45	ER0S2CKF4700	470Ω, ±1%	4
R46	ER0S2CKF2201	2.2kΩ, ±1%	1
R51	ERDS2TJ472	4.7kΩ	1

EXP EXPRESSION CIRCUIT

Ref. No.	Part No.	Description	Per/Set
CDS			
CS1	SVEG5	Light Sensitive Device	1

CPSQ SEQUENCER CONTROL CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
D1~19	MA165TA5	Diode	19
D101~104, 106~110	LN282R	LED (Red)	9
D111~125	LN382G	LED (Green)	15
SWITCHES			
S1~19	SSHG1049A	Push Switch	19
VARIABLE RESISTORS			
VR1	EVD06510B24G	20kΩ B, MAIN VOLUME	1
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
WIRE			
W1	SWEG630A	Wire	1

ACP AC POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
LINE FILTER			
L1	SLTGLF3	Line Filter	1
JACKS			
JK1	SJVD0203B	AC Inlet	1
JK2	QJSG002AA	Pedal In	1

Ref. No.	Part No.	Description	Per/Set
SWITCH			
S1	SSRG100A	Voltage Selector	1
FUSES			
F1	XBA1C40NU100	4A, 125V	1
F1	XBA2C20TB0	T2A, 250V	1
F2	XBA2C12TB0	T1.25A, 250V	1
F3	XBA2C10TB0	T1A, 250V	1
F3	Others	T1.25A, 250V	1
CAPACITORS			
C1	ECQU2A104MN	0.1μF, 250V, Across-the Line Capacitor	1
C2	ECKCVA1472MF	4700pF, Line-Capacitor	1
C3	ECRR1H104ZF	0.1μF	1
WIRE			
W1	SWEG660A	Wire	1
AC INLET COVER			
	SJS9334A	AC Inlet Cover	1
	Others	AC Inlet Cover	1

AS AMP & POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM5291P	Switching Regulator	1
IC2	SVIGM5F7815	+15V Voltage Regulator	1
IC3	SVIGM5F7915	-15V Voltage Regulator	1
TRANSISTORS			
Q1	2SA1643	Transistor	1
Q2	2SA1015-GR	2SA933STRS (SUB. Part)	1
Q3, 4, 8	2SC1815GR	Transistor	3
Q5	2SA1123S	Transistor	1
Q6	2SD1277A	Transistor	1
Q7	2SB951A	Transistor	1
DIODES			
D1, 3, 5, 7	SVDGS3V20-15	Rectifier	4
D9, 10	SVDGERA1502	Diode	2
D11	SVDGRK14S	Diode	1
D12	MA2062LF	Zener, 6.2V	1
D13, 14	MA165TA5	Diode	2
D15	MA4062	Zener, 6.2V	1
COIL			
L1	QLCGTJR10KA	Coil	1
RELAY			
RL1	SSYGMR30112	Relay	1
IC PROTECTORS			
IP1, 2	ICP-N50T104	IC Protector	2

Ref. No.	Part No.	Description	Per/Set
RESISTORS			
R1, 2	ERDS2TJ103	10kΩ	2
R3	ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	1
R4	ERX1ANJPR22S	0.22Ω, 1W, Flame-Proof	1
R5	ERDS2TJ101	100Ω	1
R6	ERDS2TJ471	470Ω	1
R7	ERDS2TJ470	47Ω	1
R8	ERG1ANJP221S	220Ω, 1W, Flame-Proof	1
R9	ER0S2TKF1001	1kΩ, ±1%	1
R10	ER0S2TKF3571	3.57kΩ, ±1%	1
R11	ERDS2TJ331	330Ω	1
R13	ERG2ANJP681S	680Ω, 2W, Flame-Ploof	1
R14	ERDS2TJ103	10kΩ	1
R15	ERDS2TJ472	4.7kΩ	1
R16	ERDS2TJ103	10kΩ	1
R17	ERDS2TJ332	3.3kΩ	1
R18	ERDS2TJ472	4.7kΩ	1
R19	ERDS2TJ103	10kΩ	1
R20	ERDS2TJ152	1.5kΩ	1
R21	ERDS2TJ223	22kΩ	1
R22	ERDS2TJ102	1kΩ	1
R23	ERDS2TJ682	6.8kΩ	1
R24	ERDS2TJ472	4.7kΩ	1
R25	ERDS2TJ153	15kΩ	1
R26, 27	ERDS2TJ222	2.2kΩ	2
R28, 29	ERX2ANJPR22S	0.22Ω, 2W, Flame-Proof	2
R30	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
R46	ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	1
CAPACITORS			
C1	ECQE1A104M6	0.1μF, 125V	1
C2, 3	ECEA1VU332	3300μF, 35V	2
C6	ECEA1VKG100	10μF, 35V	1
C7	ECCR1H101J	100pF	1
C8, 9	ECEA0JU102	1000μF, 6.3V	2
C15, 16	ECEA1VKG100	10μF, 35V	2
C17	ECKR1E473ZV	0.047μF	1
C18	ECEA1HKN010	1μF, 50V	1
C19	ECQM1H103KV	0.01μF	1
C21	ECEA0JKA470	47μF, 6.3V	1
C22	ECEA1VKG100	10μF, 35V	1
C23	ECCR1H101J	100pF	1
C24	ECCR1H221J	220pF	1
C25	ECRR1H104ZF	0.1μF	1
C26	ECEA50Y1R5	1.5μF, 50V	1
C35	ECEA50Y8R2	8.2μF, 50V	1

MKBU UPPER MANUAL KEYBOARD CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUIT			
IC1	MN50020PGV	Gate Array	1
DIODES			
S D1~88	MA162A	MA150IR (SUB. Part)	88
OSCILLATOR			
X1	EF0FC4004A3	4MHz, Ceramic Oscillator	1
COMPONENT COMBINATION			
Z1	EXBPI8472JM	4.7kΩ × 8	1

Ref. No.	Part No.	Description	Per/Set
SWITCHES			
S1~7, 38~44	SSPG7004A	Rubber Switch (7 pcs. on one)	2
S8~37	SSPG6004A	Rubber Switch (6 pcs. on one)	5
CAPACITORS			
C2	ECRR1H104ZF	0.1μF	1
C3	ECCR1H471J	470pF	1
C4	ECEA0JKA470	47μF, 6V	1

MKBL LOWER MANUAL KEYBOARD CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
S D1~88	MA162A	MA150IR (SUB. Part)	88
SWITCHES			
S45~51, 82~88	SSPG7004A	Rubber Switch (7 pcs. on one)	2
S52~81	SSPG6004A	Rubber Switch (6 pcs. on one)	5

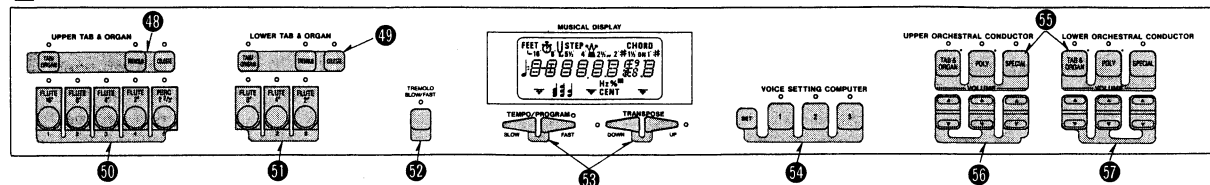
WIRING PARTS

Ref. No.	Part No.	Description	Per/Set
W1	QEXGSA06070A	Connector with Wire	1
W2	QEXGSA10080A	Connector with Wire	1
W3	QEXGSS11035A	Connector with Wire	1
W4	QEXGSS08035A	Connector with Wire	1
W5	QEXGSS13030A	Connector with Wire	1
W6	QEXGSS03055A	Connector with Wire	1
W7	QEXGSA10055A	Connector with Wire	1
W8	QEXGSA12050A	Connector with Wire	1
W9	QEXGSS12045A	Connector with Wire	1
W10	QEXGSS08040A	Connector with Wire	1
W11	QEXGSS08070B	Connector with Wire	1
W12	QEXGSA07105A	Connector with Wire	1
W13	QEXGSS09120A	Connector with Wire	1
W14	QEXGSS05040A	Connector with Wire	1
W15	QEXGSA13025A	Connector with Wire	1
W16	QEXGSA12030A	Connector with Wire	1
W17	QEXGSA04085A	Connector with Wire	1
W18	QEXGSA12090A	Connector with Wire	1
W19	QEXGVH03160B	Connector with Wire	1
W20	QEXGVH07025B	Connector with Wire	1
W21	QEXGST12160A	Connector with Wire	1
W22	QEXGVH05060B	Connector with Wire	1
W23	QEXGEH03075B	Connector with Wire	1
W24	QEXGA08100A	Pedal Cable	1
W25	QEXGVH06170B	Connector with Wire	1
W26	SWKG0326LTA	Connector with Wire	1
W27	SWKG04158LSA	Connector with Wire	1
W28	QEXGEL03045B	Connector with Wire	1

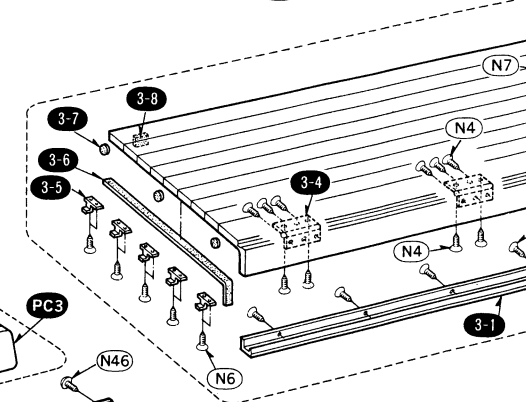
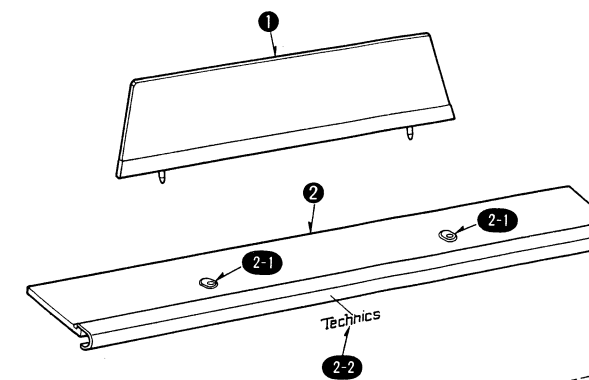
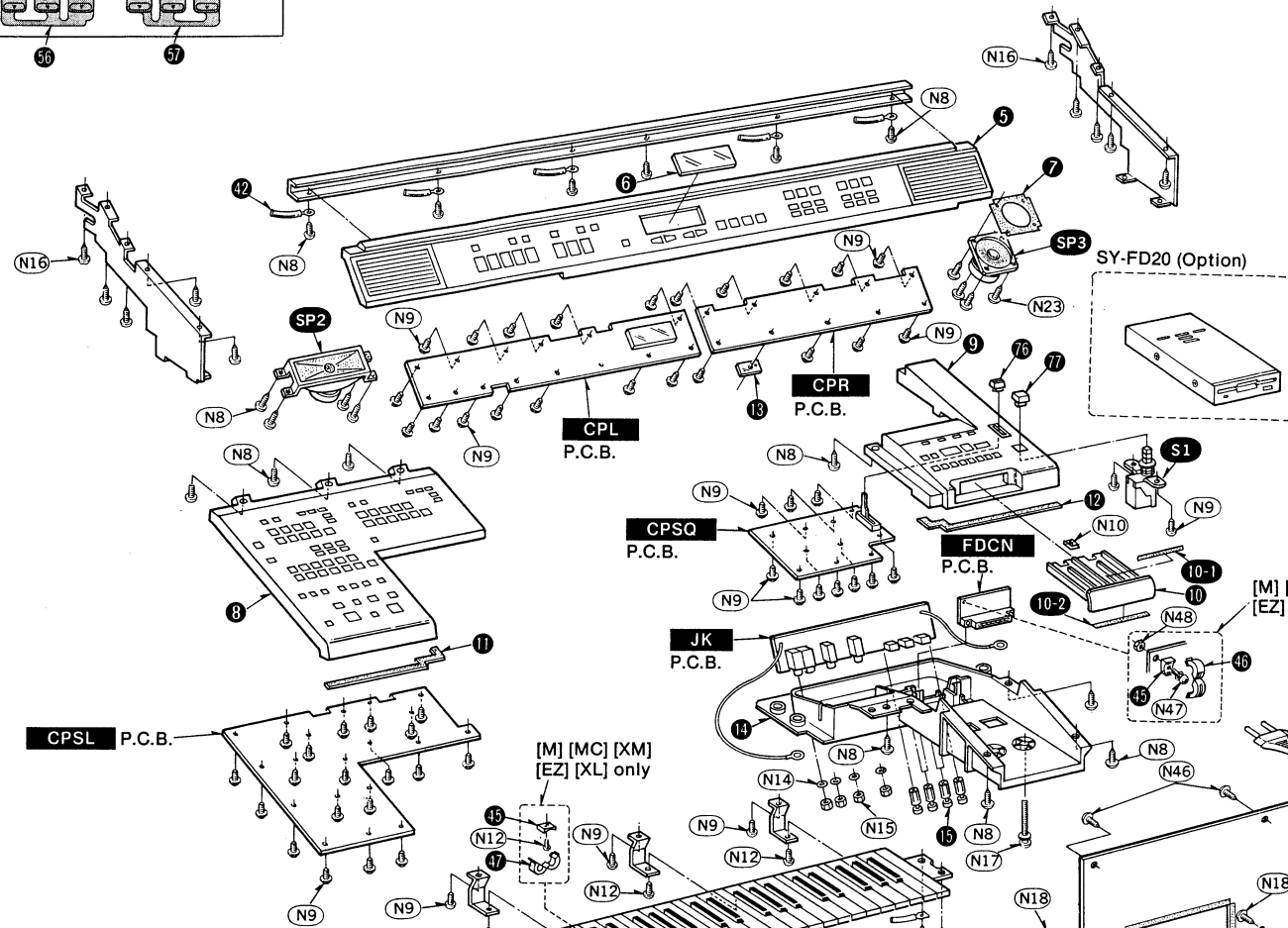
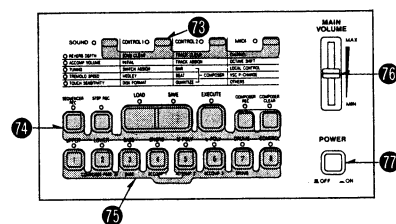
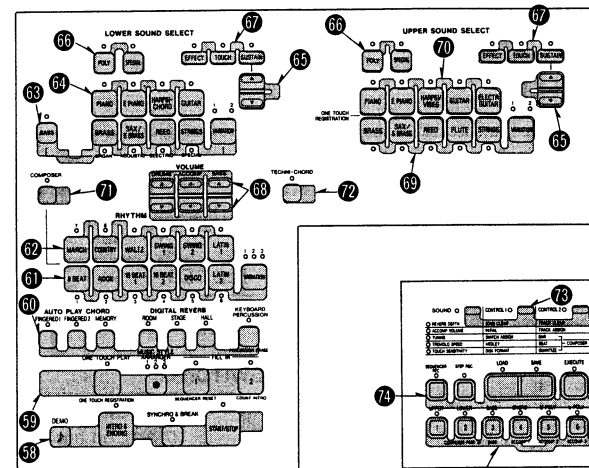
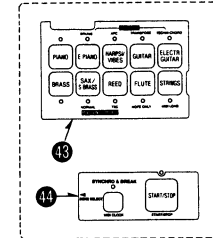
CABINET PARTS LOCATION

1 2 3 4 5 6 7 8 9 10

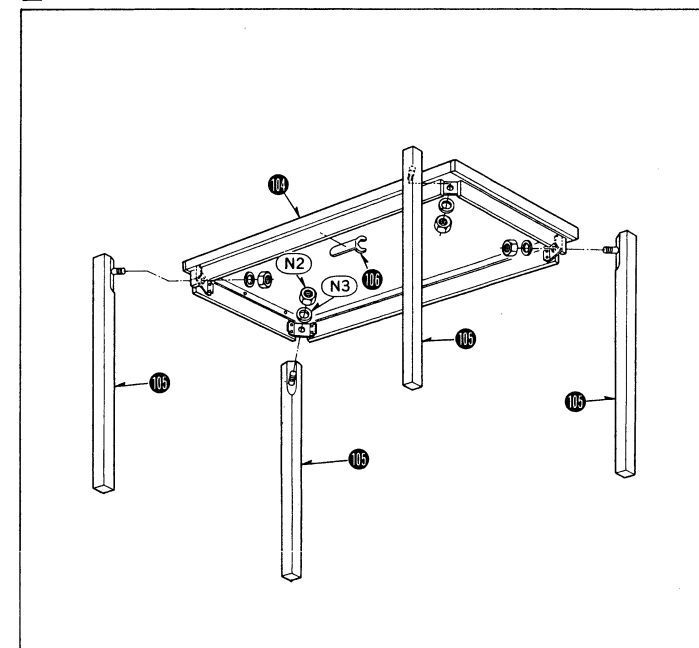
BUTTON



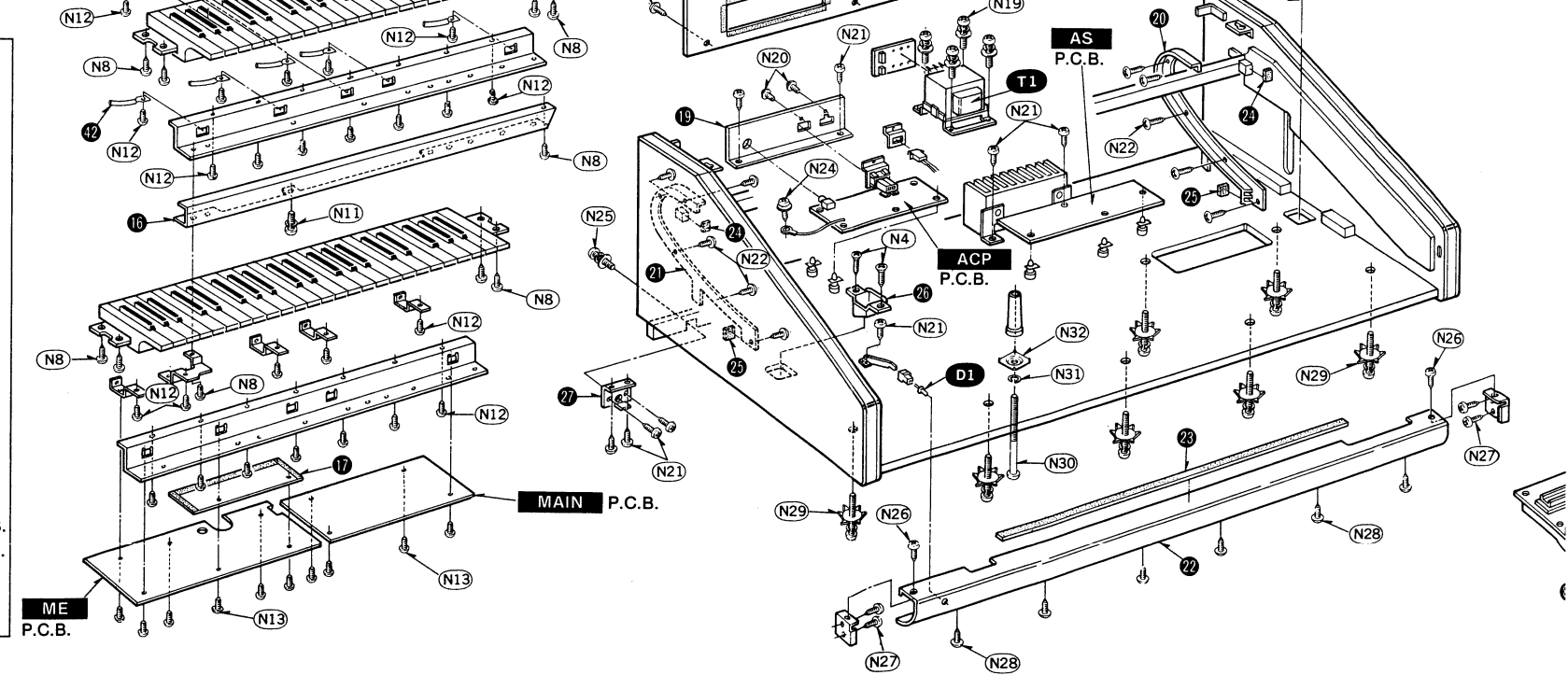
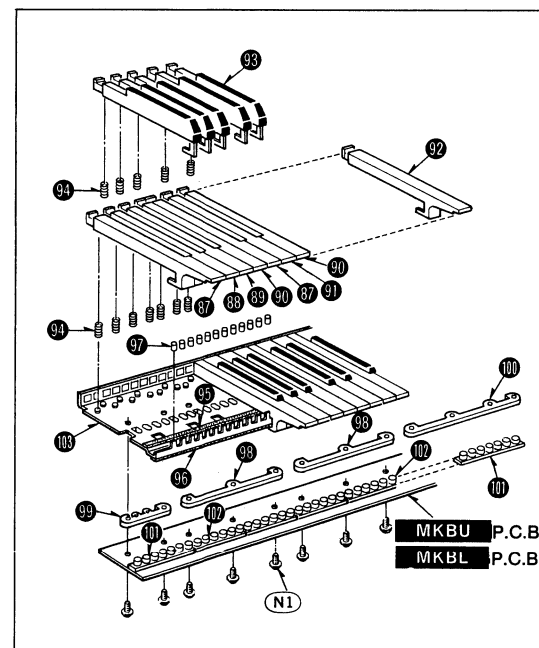
MIDI Seal

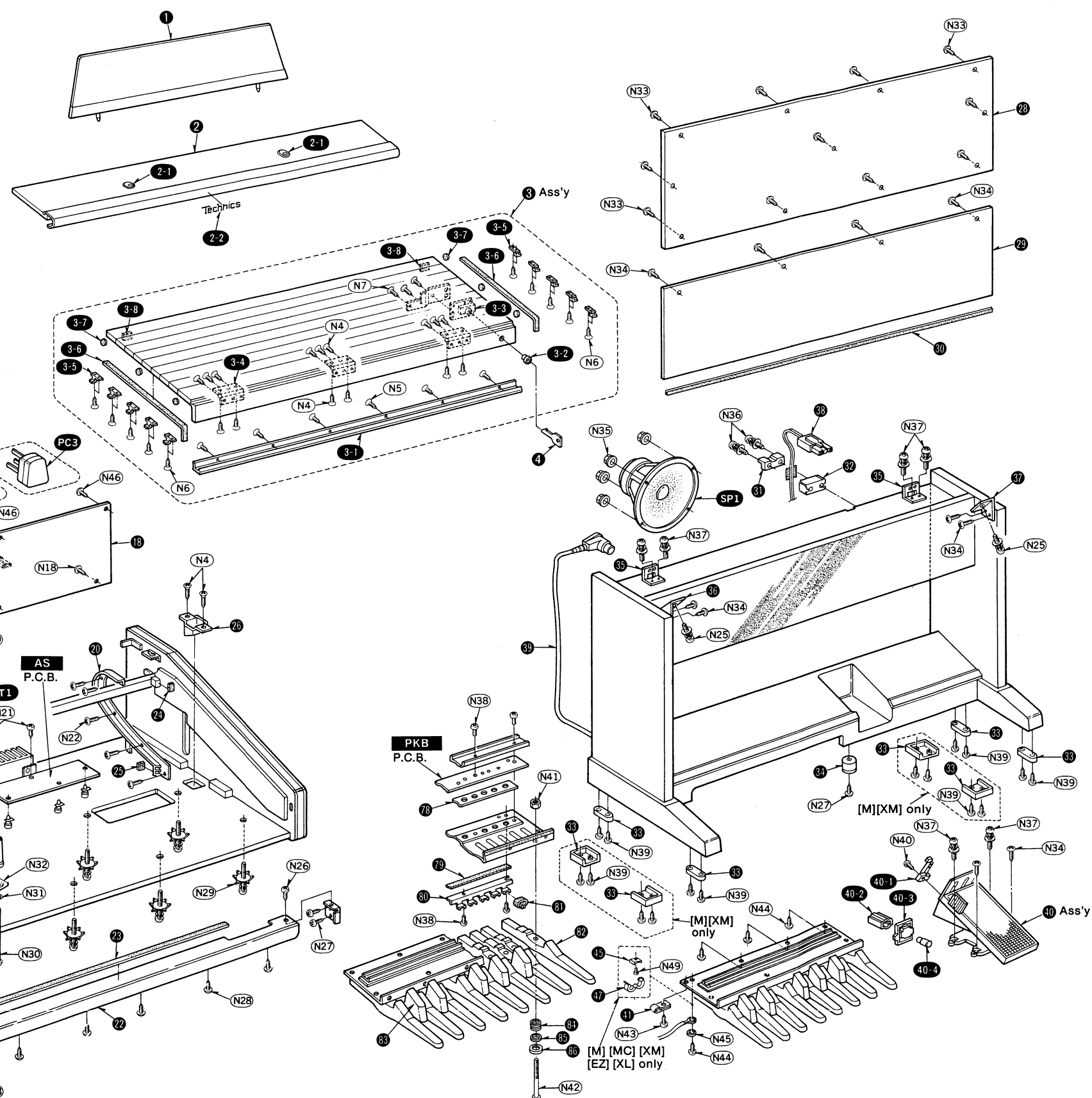
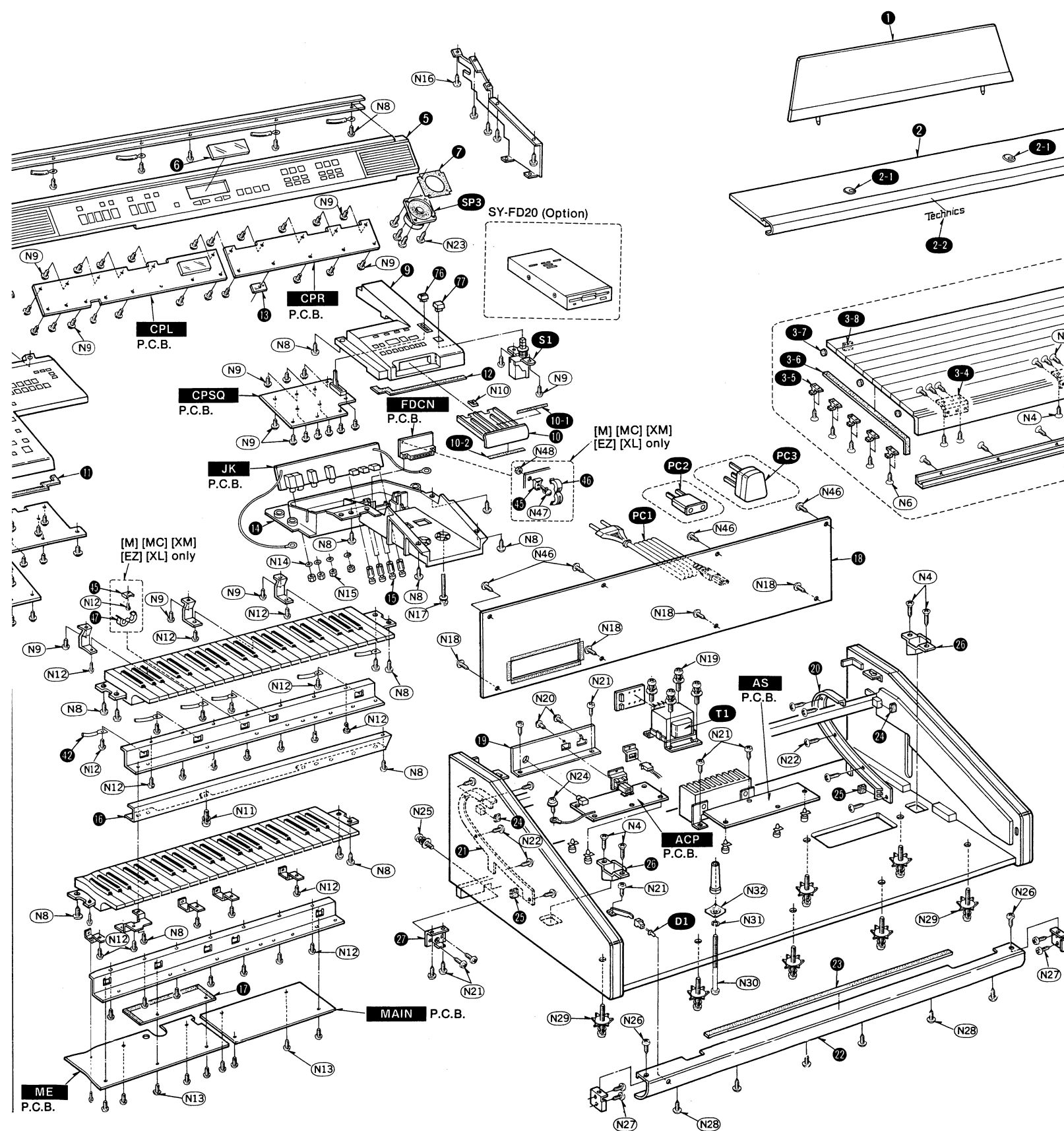


BENCH



MANUAL KEYBOARD





REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

Notes:

1. Important safety notice
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. $\bigcirc$ mark are new parts.
3. For part No. with area mark, check the area when placing an order.
4. Keyboard chassis part No. with mark (NLA) is no longer available after production discontinuation of the complete set.

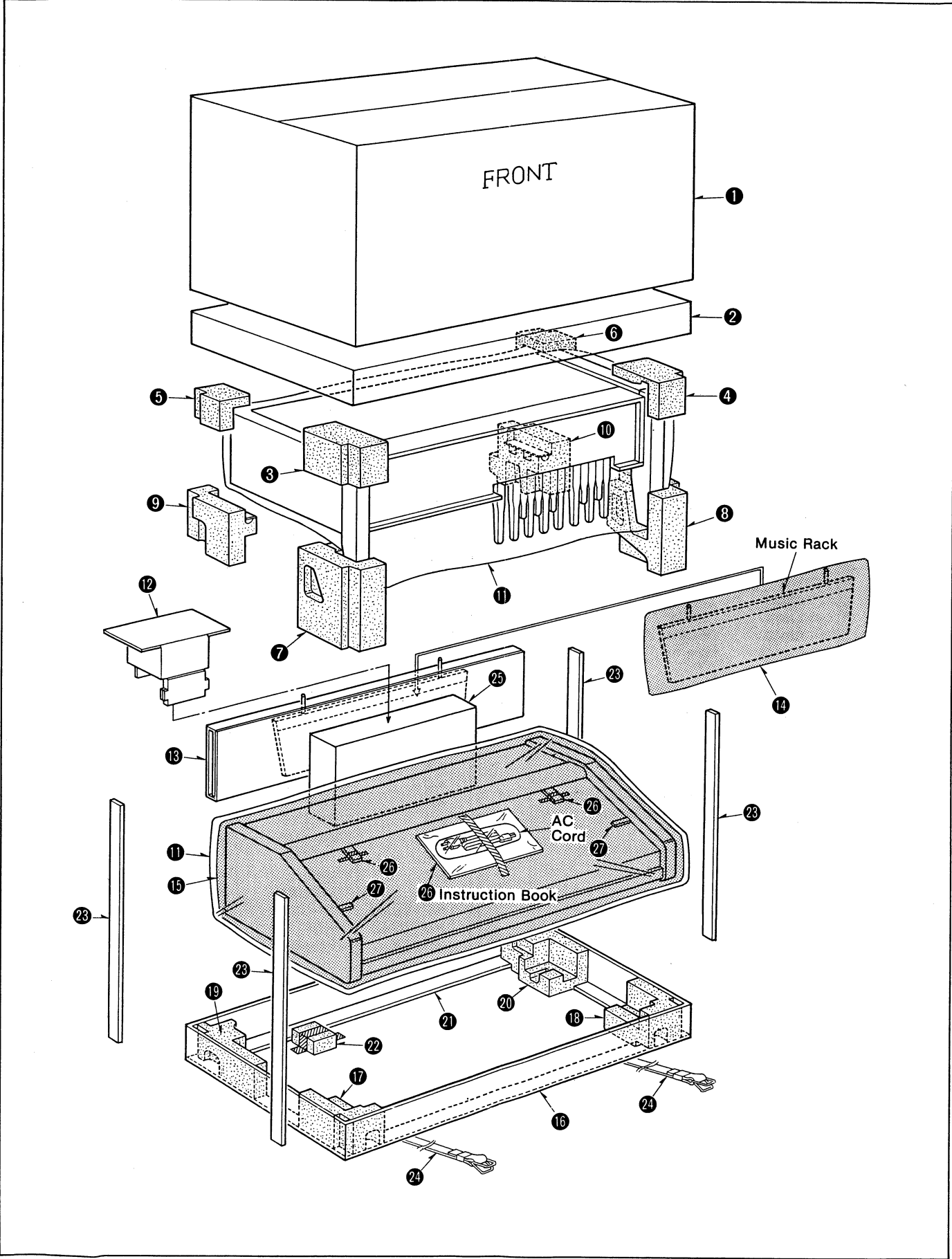
CABINET & CHASSIS PARTS

Ref. No.	Part No.	Description	Per/Set	Ref. No.	Part No.	Description	Per/Set
POWER SWITCH				$\bigcirc$ 12	QMFG4055AA	Felt	1
S1	Δ SSHG1050A	Power Switch	1	$\bigcirc$ 13	QMRG2013AA	Insulator	1
SPEAKERS				$\bigcirc$ 14	QYPG1015BB	Jack Panel	1
SP1	EAS20PL255A	Speaker, 20cm 4 Ω	1	15	SNEG1700A	Latch	6
SP2	EAS15S09A	Speaker, 13 $\times$ 6cm 8 Ω	1	$\bigcirc$ 16	QGKG0056AA	Ornament	1
SP3	EAS65PH89A	6.5cm, 12 Ω	1	$\bigcirc$ 17	QSCG037A	Shield Parts	1
TRANSFORMER				$\bigcirc$ 18	QKQGD023AA	Rear Board, Upper Cabinet	1
$\bigcirc$ T1	Δ QTPG1M008A	Power Transformer	1	$\bigcirc$ 19	Δ SMKG3483A	AC Panel	1
$\bigcirc$ T1	Δ QTPG1M011A	Power Transformer	1	$\bigcirc$ 19	SMKG3482A	AC Panel	1
$\bigcirc$ T1	Δ QTPG1M010A	Power Transformer	1	20	SKEG7831A	Guide Rail, Right	1
POWER CORD & PLUG				21	SKEG7830A	Guide Rail, Left	1
PC1	Δ QJAG001AA	AC Power Cord	1	$\bigcirc$ 22	QKSGE001BA	Ornament	1
PC1	Δ SJAG61	AC Power Cord	1	23	SHSG2870A	Felt	1
PC1	Δ SJAG62	AC Power Cord	1	$\bigcirc$ 24	QMFG1072AA	Felt	2
PC1	Δ SJAG65	AC Power Cord	1	25	SHSG7020A	Felt	2
PC2	Δ SJP5213-1	Attachment Plug	1	26	SUWG3010A	Bracket	2
PC3	Δ SJPG1350A	Power Plug	1	$\bigcirc$ 27	SUWG3001A	Bracket	2
DIODES				28	SKFG1291A	Rear Board, Speaker Box	1
D1	LN29RP	LED, Power Indicator	1	$\bigcirc$ 29	QKUG1014AA	Rear Board, Lower Cabinet	1
CABINET PARTS				$\bigcirc$ 30	QMFG4057AA	Felt	1
$\bigcirc$ 1	QYAG2003AA	Music Rack Ass'y	1	31	SHRG1120A	Cord Clamper	1
$\bigcirc$ 2	QKQGA040AA	Top Cover	1	32	SHRG1110A	Cord Clamper	1
$\bigcirc$ 2-1	QMRG7021AA	Sleeve	2	33	SHRG2130B	Foot	4
2-2	SGBG160A	Technics Badge	1	$\bigcirc$ 33	SHRG2120D	Foot	4
$\bigcirc$ 3	QKQGF005AA	Sliding Cover	1	$\bigcirc$ 34	QKAG0004AA	Foot	1
3-1	SGXG419A	Ornament	1	35	SUWG3020A	Bracket	2
3-2	SBEG40A	Staple	1	36	SUWG3350A	Bracket	1
3-3	SBEG31A	Lock	1	37	SUWG3351A	Bracket	1
3-4	SBHG6007-1	Hinge	3	$\bigcirc$ 38	QEXGEL03045B	Wire with Connector	1
3-5	SHRG9930A	Catch, Guide Rail	10	$\bigcirc$ 39	QEXGZA08100A	Pedal Cable	1
3-6	SHSG3990A	Felt	2	40	SXVG5110A	Expression Pedal	1
3-7	SHSG119	Felt	6	40-1	SSHG14	Foot Switch	1
3-8	SHSG3560A	Felt	2	40-2	RJS205ZA	Socket	1
4	SBEG60A	Key	1	40-3	SHGG908	Lamp Holding Rubber	1
$\bigcirc$ 5	QGPG0032BB	Upper Control Panel	1	40-4	XAMR55P	Lamp	1
$\bigcirc$ 6	QKWG003AA	Display Cover Panel	1	41	SHRG1230A	Cord Clamper	1
$\bigcirc$ 7	QMFG4053AA	Speaker Net	1	42	SUWG219	Binder	11
$\bigcirc$ 8	QGPG0033BB	Lower Control Panel, Left	1	$\bigcirc$ 43	QQLG035AA	MIDI Seal	1
$\bigcirc$ 9	QGPG0034AB	Lower Control Panel, Right	1	$\bigcirc$ 44	QQLG034AA	MIDI Seal	1
$\bigcirc$ 10	QYPG1016AA	Cover	1	45	SHRG1270A	Mounting Base	3
10-1	SHSG5820A	Felt	1	$\bigcirc$ 46	QLZG001A	Core	1
10-2	SHSG5830A	Felt	1	47	SLQGTRCC20	Core	2
$\bigcirc$ 11	QMFG4054AA	Felt	1	BUTTON			
				$\bigcirc$ 48	QGUG1102BA01	Button	1
				$\bigcirc$ 49	QGUG1103AA01	Button	1
				$\bigcirc$ 50	QGUG1104BA01	Button	1
				$\bigcirc$ 51	QGUG1105BA01	Button	1
				$\bigcirc$ 52	QGUG1106AA	Button	1
				$\bigcirc$ 53	QGUG1107AA	Button	2
				$\bigcirc$ 54	QGUG1109AA02	Button	1
				$\bigcirc$ 55	QGUG1110BA01	Button	2
				$\bigcirc$ 56	QGUG1112BA01	Button	1

Ref. No.	Part No.	Description	Per/Set
57	QGUG1113BA01	Button	1
58	QGUG1114AA01	Button	1
59	QGUG1115BA01	Button	1
60	QGUG1116AA	Button	1
61	QGUG1117BA01	Button	1
62	QGUG1118BA01	Button	1
63	QGUG1120BA01	Button	1
64	QGUG1121BA01	Button	1
65	QGUG1122AA01	Button	2
66	QGUG1123BA01	Button	2
67	QGUG1124AA01	Button	2
68	QGUG1125AA01	Button	2
69	QGUG1127BA01	Button	1
70	QGUG1128BA01	Button	1
71	QGUG1129AA01	Button	1
72	QGUG1130AA01	Button	1
73	QGUG1131AA	Button	1
74	QGUG1132AA	Button	1
75	QGUG1133AA01	Button	1
76	SBNG7031A	Knob, Main Volume	1
77	QGUG1040AA	Button, Power Switch	1
PEDAL KEYBOARD			
78	SHGG50A	Rubber Switch (5 pcs. on one)	3
79	SHSG1600B	Felt	1
80	STBG4011A	Key Guide	1
81	SHSG1460A	Felt	13
82	STBG1091C	White Key	8
83	STBG2052A	Black Key	5
84	SUSG180A	Spring	13
85	SHGG8130A	Rubber	13
86	SHRG9240A	Spacer	13
MANUAL KEYBOARD			
87	STBG1100A	White Key (C and F Key)	14
88	STBG1130A	White Key (G Key)	8
89	STBG1140A	White Key (A Key)	8
90	STBG1120A	White Key (E and B Key)	14
91	STBG1110A	White Key (D Key)	6
92	STBG1150A	White Key (Top Octave C Key)	2
93	STBG2070A	Black Key	36
94	SUSG270A	Spring	88
95	SHSG1931A	Felt	2
96	SHSG3960A	Felt	2
97	SHGG9050A	Key Guide Rubber	88
98	SHRGA9010A	Spacer	4
99	SHRGA9021A	Spacer	2
100	SHRGA9030A	Spacer	2
101	SSPG7004A	Rubber Switch (7 pcs. on one)	4
102	SSPG6004A	Rubber Switch (6 pcs. on one)	10
103	(NLA) STBG6106A	Chassis	2
BENCH			
104	QKQGA033AAK	Seat	1
105	QKQGZ044AAK	Leg	4
106	QFBG007AA	Spanner	1

Ref. No.	Part No.	Description	Per/Set
SCREWS & WASHERS			
N1	XTW3+10T	Screw	12
N2	XNH10G	Nut	4
N3	XWB10B	Washer	4
N4	XTS35+12A	Screw	19
N5	XTS3+10AFVC	Screw	6
N6	XTS4+12A	Screw	20
N7	XTS3+12A	Screw	3
N8	XTB4+12A	Screw	28
N9	XTW3+10Q	Screw	56
N10	SNEG2620A	Speed Nut	1
N11	XYN5+C10	Screw with Washer	1
N12	XTB3+5C	Screw	27
N13	XTW3+10T	Screw	10
N14	SNEG770A	Washer	4
N15	XNS12FZ	Nut	4
N16	XTB4+10BFZ	Screw	10
N17	XYN4+F30	Screw with Washer	1
N18	XTT4+20AFZ	Screw	4
N19	XYN4+F25	Screw with Washer	4
N20	XTW3+8JFZ	Screw	2
N21	XTB35+12A	Screw	13
N22	XTT4+14A	Screw	10
N23	XTB4+8C	Screw	4
N24	SNEG2660A	Screw	1
N25	SNEG2270A	Screw with Washer	4
N26	XTB3+8BFVC	Screw	2
N27	XTB35+20A	Screw	5
N28	XTT35+10AFVC	Screw	6
N29	QHDG006AA	Screw	7
N30	XSN5+85FVC	Screw	1
N31	XWA5B	Washer	1
N32	SNEG150A	Washer	1
N33	XTT35+30AFZ	Screw	11
N34	XTT4+16AFZ	Screw	10
N35	SNE499-1	Nut	4
N36	XYN3+F30	Screw with Washer	2
N37	XYN4+F20FZ	Screw with Washer	6
N38	XTB3+6B	Screw	11
N39	XTV3+16B	Screw	8
N39	MT XV XTB35+25A	Screw	8
N40	XTN26+6B	Screw	1
N41	XNG5BS	Nut	13
N42	SNEG1720B	Bolt	13
N43	XTB35+14A	Screw	1
N44	XTT4+16A	Screw	4
N45	XWA4B	Washer	1
N46	XTT35+25AFZ	Screw	4
N47	MT MC XYN3+C10	Screw with Washer	1
N48	MT EZ XNG3B	Nut	1
N49	XL XTB3+16A	Screw	1

PACKING



PACKING PARTS

Ref. No.	Part No.	Description	Per/Set
1	QPGG0105AB	Carton Box	1
1	M QPGG0109AB	Carton Box	1
2	QPGG0107AA	Top Case	1
3	QPNG0195AA	Pad	1
3	M QPNG0216AA	Pad	1
4	QPNG0196AA	Pad	1
4	M QPNG0217AA	Pad	1
5	QPNG0197AA	Pad	1
5	M QPNG0218AA	Pad	1
6	QPNG0198AA	Pad	1
6	M QPNG0219AA	Pad	1
7	QPNG0224AA	Pad	1
8	QPNG0225AA	Pad	1
9	QPNG0226AA	Pad	1
10	QPNG0227AA	Pad	1
11	SPHG220A	Polyethylene Bag	2
12	QPGG0111BA	Pad	1
13	SPNG2077A	Music Rack Case	1
14	QPHG039AA	Protection Cover	1
15	SPHG280A	Protection Sheet	1
16	QPGG0106AA	Bottom Case	1
17	QPNG0211AA	Pad	1
18	QPNG0212AA	Pad	1
19	QPNG0213AA	Pad	1
20	QPNG0214AA	Pad	1
21	QPQG011AA	Frame	1
22	QPNG0215AA	Pad	1
23	QPQG012AA	Prop	4
23	M QPQG013AA	Prop	4
24	SPSG40A	Band	2
25	QPZGM007A	Packing Case, Bench	1
26	SPNG5161A	Spacer	2
27	SHSG2090A	Felt	2

INSTRUCTION BOOK			
28	EX QQFGEN4AA	Instruction Book	1
28	M QQFGEN4CA	Instruction Book	1
28	W QQFGEN4DA	Instruction Book	1
28	EX EZ QQFGEN4EA	Instruction Book	1
28	EX QQFGEN4FA	Instruction Book	1
28	EX QQFGEN4GA	Instruction Book	1
28	EX QQFGEN4HA	Instruction Book	1
28	EX QP QQFGEN4JA	Instruction Book	1
28	X QQFGEN4KA	Instruction Book	1
28	EX Y JS QQFGEN4LA	Instruction Book	1